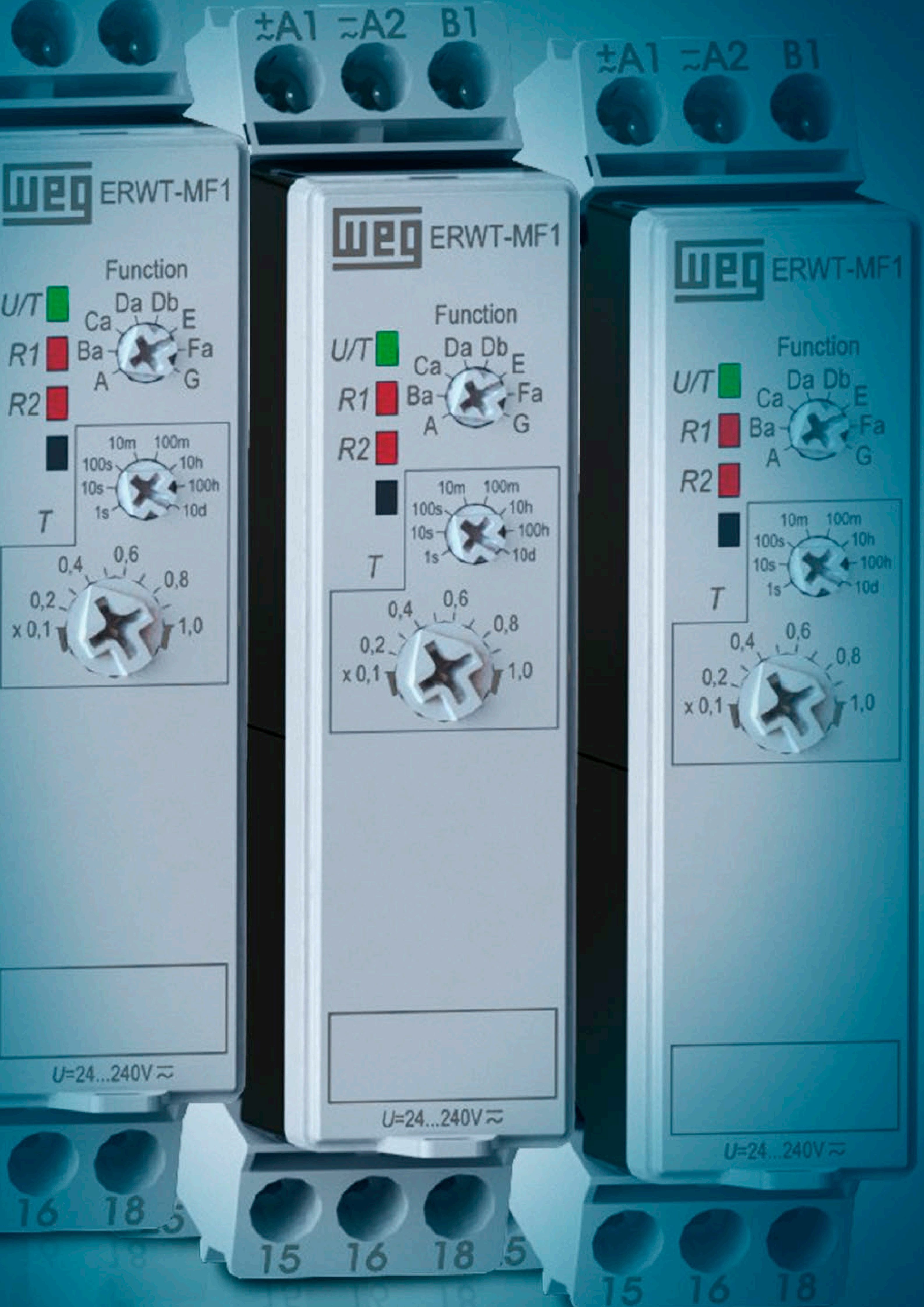
Automation

Electronic Relays

- Timing
- Monitoring
- Level



±A1 ∓A2 B1
WEG ERWT-MF1
Function
U/T
R1
R2
Ca Da Db E
Ba Fa
A G
10m 100m
100s 10h
10s 100h
1s 10d
T
0,4 0,6
0,2 0,8
x 0,1 1,0
U=24...240V
15 16 18

Electronic Relays

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The Electronic Relays were designed according to international standards, being a compact solution for industrial, commercial and residential applications.

Characteristics

- LEDs for status indication
- Simple configuration and operation
- Adjustments via dial
- High-reliability contacts
- Excellent precision and repeatability
- 22.5 mm compact housing
- Direct mounting on DIN rail or fixed with screws and PLMP accessory

Timing Relays

- RTW - Wide range of functions, timing options and voltages
- RTW-MAT / MBT - Multiple timing with time setting from 0.1s to 150h and a wide voltage range 24-240 V ac/dc (50/60 Hz)
- ERWT-MF1 / MF2 - Multifunction with eight configurable functions, multiple timing with setting from 0.1s to 10 days and a voltage range of 24-240 V ac/dc (50/60 Hz)
- Models with 1 or 2 NOC outputs

Monitoring

RPW - Single Function Models

- SF - Phase sequence
- FF - Phase loss
- FSF - Phase sequence and phase loss
- SS - Undervoltage and overvoltage
- PTC - Overheating
- Wide supply voltage range

ERWT - Multifunction Models

- ERWT-VM1 / VM2 - Up to 6 monitoring functions
- Supply voltage from 208 to 480 V ac
- 01 relay output with reversible contact

Level

- Monitoring and automatic level adjustment of electric current liquid conductors
- Filling (EN) and draining (ES) function
- Sensitivity adjustment by means of dials
- 2 electrode types (accessories)

COMPACT

HIGH RELIABILITY

EASY INSTALLATION

Standards
IEC / EN 1812-1
IEC / EN 60947-1
IEC / EN 60947-5-1
UL 508 CAN/CSA C22.2

Certifications

TIMING RELAYS

Electronic devices that allow switching an output signal according to the timing range function and selected time. Designed according to international standards, they are available in 22.5 mm wide housings and can be mounted on DIN rails 35 mm or fixed with screws (PLMP accessory required) - available with one or two NOC outputs. They can be used in various types of industrial applications, such as electric motor starters, control panels, industrial furnaces and die casting machines. They can also be used in residential and commercial applications.

Selection

ERWT - MF1 02 - MT1 - E05

RTW	Single or multiple timing relay
ERWT	Multifunction timing relay

Selection of the function	
RE	Delay and impulse
PE	Impulse ON
CI	Flasher 2 settings, start ON[1]
CIR	Flasher 2 settings, start OFF[1]
CIL	Flasher 1 setting, start ON
CID	Flasher 1 setting, start OFF
RD	OFF-delay with control signal
RDI	OFF-delay[1]
ET	Star-delta[2]
MF1	**8 configurable functions[3]**
A	ON-delay
Ba	ON-delay with control signal
Ca	ON-delay and OFF-delay with control signal
Da	Symmetric flasher, start ON
Db	Asymmetric flasher, start OFF
E	Impulse ON with control signal
G	Star-delta
MF2	**8 configurable functions[3]**
Dc	Asymmetric flasher, start ON
Dd	Asymmetric flasher, start OFF
De	Percentage flasher, start ON
Df	Percentage flasher, start OFF
Dg	Flasher for motor reversing
Cb	ON-delay and OFF-delay with control signal and independent settings
Ia	Delayed adjustable-length pulse
J	Bistable

Power supply selection		
Alternating (50/60 Hz) / Direct		
Code	Description	Applicable RTW
E26	24 V ac / 24 V dc	RE, PE, CI, CIR, CIL, CID, ET
E33	48 V ac / 24 V dc	RE, PE, CI, CIR, CIL, CID, ET
E37	110-130 V ac / 24 V dc	RE, PE, CI, CIR, CIL, CID, ET
E40	220-240 V ac / 24 V dc	RE, PE, CI, CIR, CIL, CID, ET
E05[9]	24-240 V ac / 24-240 V dc	RE, PE, CI, CIR, CIL, CID, ET, RD, RDI
Alternating current (50/60 Hz)		
Code	Description	Applicable RTW[10]
D02	24 V ac	RD
D07	48 V ac	RD
D61	110-130 V ac	RD
D66	220-240 V ac	RD
D71	380-440 V ac	RE, PE, ET
Continuous voltage		
Code	Description	Applicable RTW
C03	24 V dc	RD

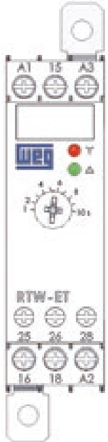
Timing	
U001S	0.1 - 1s[5]
U003S	0.3 - 3s
U010S	1 - 10s
U030S	3 - 30s
U060S	6 - 60s
U100S	10 - 100s
U300S	30 - 300s
U010M	1 - 10min[6]
U030M	3 - 30min[6]
MAT	0.1s - 10min[7]
MBT	0.2s - 150h[7]
MT1	0.1s - 10 dias[8]

Number of output contacts	
01	1 NOC contact[4]
02	2 NOC contacts

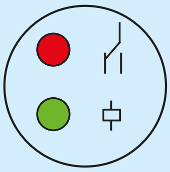
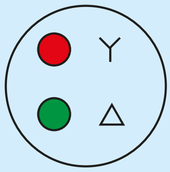
Notes: 1) Not available for multiple timing relays (RTW-M);
2) For single timing RTW-ET relays, only the 3 - 30 s timing range selection is available (U030S).
For multiple timing RTW-ET relays, only the 0.1s - 10min timing selection is available (MAT);
3) MF1 and MF2 available only for ERWT multifunction relays;
4) Not available for the star-delta relays (RTW-ET) and multifunction relays (ERWT-MF1, MF2);
5) Timing range U001S (0.1 - 1s) not available for the RTW-CI, CIR, RD and RDI relays;
6) Timing range U010M (60 - 600s) and U030M available only for the RTW-RDI relays;
7) Timing ranges MAT/MBT available only for the RTW-RE, PE, RD, CIL, CID or ET relays;
8) Timing range MT1 available only for ERWT-MF1 and MF multifunction relays;
9) For all single timing relays: RTW-CI, CIR and RDI.
For the multiple timing relays (MAT/MBT): RE, PE, CI, CIL, CIR, CID, RD and ET.
For multifunction relays: MF1 and MF2;
10) Only single timing relays.

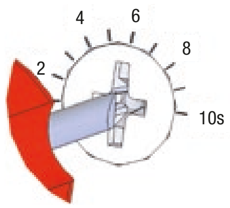
Time Range Adjustment

Single Timing



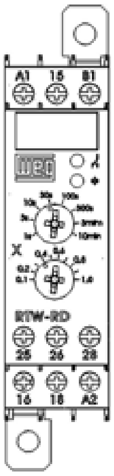
Example: RTW-ET

	RTW - RE / PE / CI / CIR / CIL / CID / RD		RTW - ET	
Red LED	Output ON		Time Y	
Green LED	Supply voltage		Time Δ	

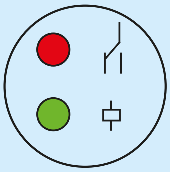
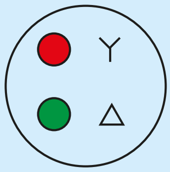
RTW	RE / PE / CIL / CID	RD / CI / CIR	RDI	ET
	0.1 - 1s [1)]	0.3 - 3s	0.3 - 3s	3 - 30s
	0.3 - 3s	1 - 10s	1 - 10s	
	1 - 10s	3 - 30s	3 - 30s	
	3 - 30s	6 - 60s	6 - 60s	
	6 - 60s	10 - 100s	10 - 100	
	10 - 100s	30 - 300s	30 - 300s	
	30 - 300s	3 - 30min	1 - 10min	
	3 - 30min	-	-	

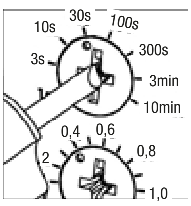
Note: 1) Not available in the version with supply voltage of 380-440 V ac

Multiple Timing



Example: RTW-RD

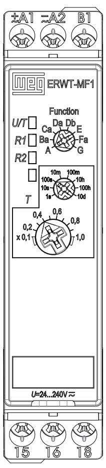
	RTW - RE / PE / CIL / CID / RD		RTW - ET	
Red LED	Output ON		Time Y	
Green LED	Supply voltage		Time Δ	

	RE / PE / CID / RD	ET
	0.1s - 10min	0.1s - 10min
	0.2s - 150h	

The RTW multiple timing relay has two adjustments via dials that must be combined to define the desired timing. First you should select the time range in the upper dial and then the multiplier in the lower dial; thus the result of the multiplication of the selected values will be the time to be counted.

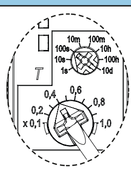
Notes: The RTW with multiple timing function must be reset at each new time range adjustment.
Changing the time range during the timing will have no effect.

Multifunction



Example: ERWT-MF1

	ERWT-MF1 / MF2	
Red LED	Output ON	U/T
Green LED	Supply voltage	R1

ERWT - MF1 / MF2	
	0.1s - 10 days

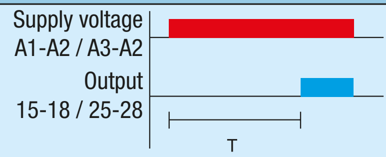
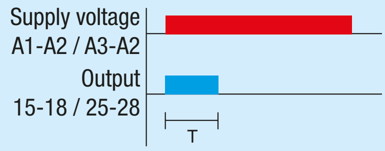
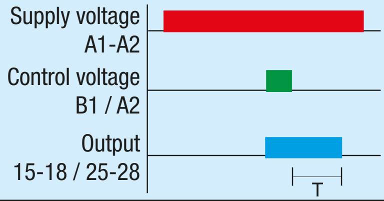
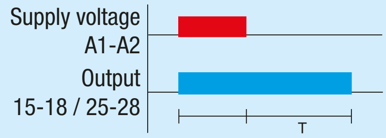
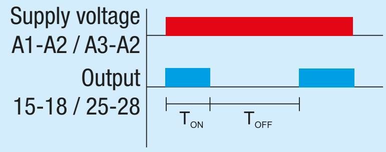
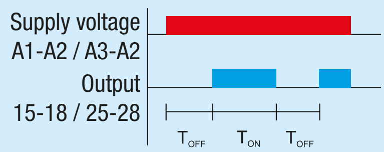
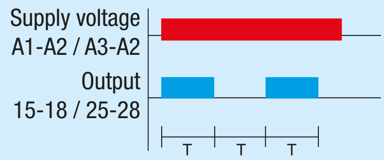
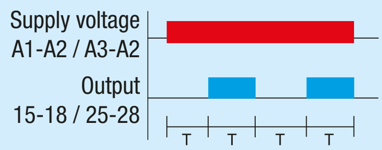
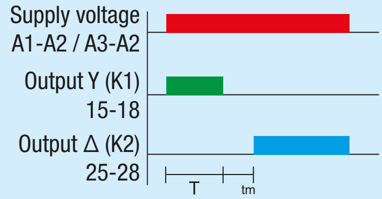
The ERWT multifunction relay has dials, enabling the adjustment of the desired MF1 or MF2 function and the timing range (0.1s - 10 days).

See the content of the MF1 and MF2 function in the specification table.

Notes: The function must be selected before energizing the timing relay; changes in operation will have no effect.
Changes made to the time configuration during the timing will be effected.

Functions

Single Timing (RTW) or Multiple Timing (RTW-MAT/MBT) Relays

<table>
<tr><th>Operating mode</th><th>Timing diagram</th></tr>
<tr><td>RTW RE (ON-delay) – After the relay is energized, the time (T) set on the dial begins. After the end of the delay time, the output contacts switch on and remain energized until the supply voltage is removed.</td><td>
</td></tr>
<tr><td>RTW PE (impulse ON) – After the relay is energized, the output contacts switch on without delay and remain energized for the time (T) set on the dial.</td><td>
</td></tr>
<tr><td>RTW RD (OFF-delay) – With the relay energized, the output contacts switch on without delay when the command contact is energized. When the control supply voltage is removed, the output contacts return to their original condition after the time (T), set on the dial, elapses.</td><td>
</td></tr>
<tr><td>RTW RDI (OFF-delay with no control) – After the relay is energized, the output contacts switch on without delay. If the supply voltage is removed, the selected time delay begins, and, when such is completed, the output contacts switch OFF.</td><td>
</td></tr>
<tr><td>RTW CI (flasher 2 adjustments start ON) – After the relay is energized, the output contacts switch ON and OFF in cycles with the first cycle ON. The upper dial sets the time (T_{ON}) the contacts remain energized, while the lower dial selects the time (T_{OFF}) the contacts remain de-energized.</td><td>
</td></tr>
<tr><td>RTW CIR (flasher 2 adjustments start OFF) – After the relay is energized, the output contacts switch ON and OFF in cycles with the first cycle OFF. The upper dial sets the time (T_{ON}) the contacts remain energized, while the lower dial (T_{OFF}) selects the time the contacts remain de-energized.</td><td>
</td></tr>
<tr><td>RTW CIL (flasher 1 adjustment ON) – After the relay is energized, the output contacts switch ON and OFF in cycles with the first cycle ON. A single selection determines the relay ON and OFF time.</td><td>
</td></tr>
<tr><td>RTW CID (flasher 1 adjustment OFF) – After the relay is energized, the output contacts remain OFF. After the time selected on the dial elapses, the contacts switch on, such behavior will continue in cycles. A single selection determines the relay ON and OFF time.</td><td>
</td></tr>
<tr><td>RTW ET (star-delta) – After the relay is energized, the star output contacts switch on without delay and remain energized for the time (T) set on the dial. After the fixed time tm, the delta terminals switch on and will remain energized until the supply voltage is disconnected.</td><td>
</td></tr>
</table>

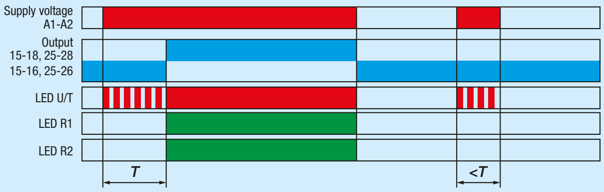
Functions

Multifunction Models (ERWT-MF1)

Operating mode

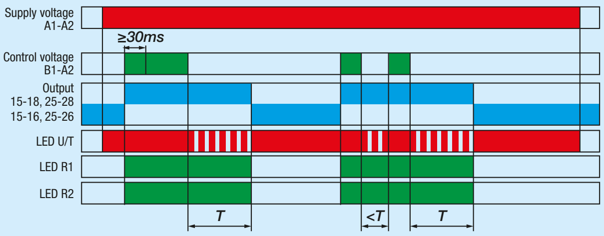
A (ON-delay) – Timing begins when the supply voltage is applied. When the time delay (T) is completed, the output relay is energized. If the supply voltage is interrupted, the output relay is de-energized in case it is energized (after the time delay). If the relay supply voltage is interrupted before the time is completed, the time delay is reset and the output relay won't be energized. This function requires the continuous application of supply voltage.

Timing diagram



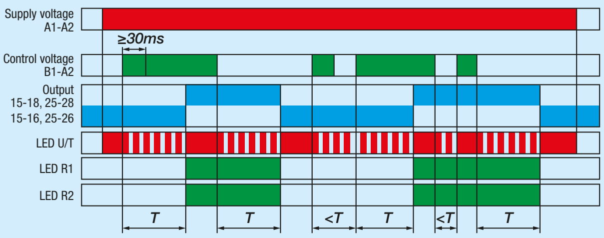
Ba (OFF-delay with control signal) – Timing begins when the supply voltage is applied. When the selected time delay (T) is completed the output relay is de-energized. If the supply voltage is interrupted, the output relay is de-energized in case it is energized (after the time delay). If the relay supply voltage is interrupted before the time is completed, the time delay is reset and the output relay won't be energized. This function requires the continuous application of supply voltage.

Timing diagram



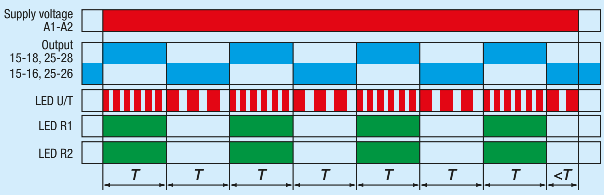
Ca (ON and OFF-delay with control signal) – Timing begins when the supply voltage is applied. When the selected time delay (T) is completed, the output relay is energized and/or de-energized, depending on the current situation. If the supply voltage is interrupted, the output relay is de-energized in case it is energized (after the time delay). If the relay supply voltage is interrupted before the time is completed, the time delay is reset and the output relay won't be energized. This function requires the continuous application of supply voltage.

Timing diagram



Da (symmetric flasher, start ON) – Applying the supply voltage, timing begins with times given by T1 (output ON) and T2 (output OFF). The cycle starts with the output relay energized. The times of full scale range T1 and T2 are the same. The total cycle is given by T = T1+T2. Interrupting the supply voltage with the output energized resets the time delay and de-energizes the output relay. This function requires the continuous application of supply voltage.

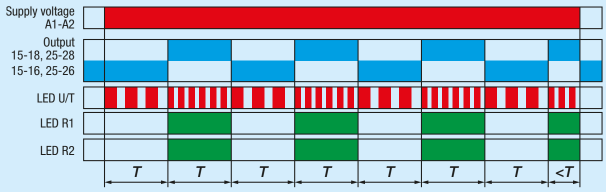
Timing diagram



Operating mode

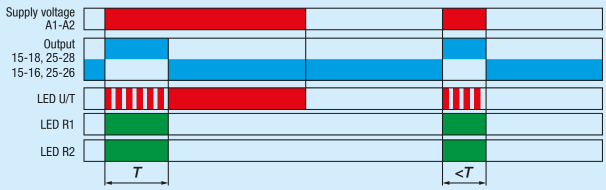
Db (symmetric flasher, start OFF) – Applying the supply voltage, timing begins with times given by T1 (output ON) and T2 (output OFF). The cycle starts with the output relay de-energized. The times of full scale range T1 and T2 are the same. The total cycle is given by T = T1+T2. Interrupting the supply voltage with the output energized resets the time delay and de-energizes the output relay. This function requires the continuous application of supply voltage.

Timing diagram



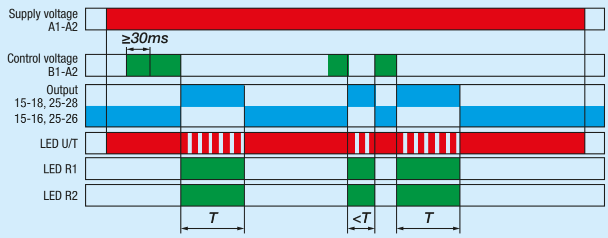
E (Impulse ON) – The output relay is immediately energized when the supply voltage is applied and de-energized when the selected time (T) is completed. If the supply voltage is interrupted before the time delay is completed, the relay is de-energized and the time delay is reset. This function requires the continuous application of supply voltage.

Timing diagram



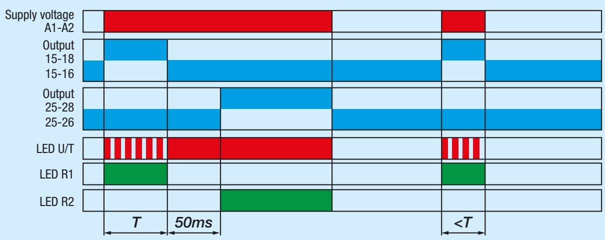
Fa (Impulse ON with control signal) – The output relay is energized after the control supply voltage is applied and de-energized when the time delay (T) is completed. If the supply voltage is interrupted before the time delay is completed, the relay is de-energized and the time delay is reset. This function requires the continuous application of supply voltage.

Timing diagram



G (star-delta) – Applying the supply voltage, the star output relay is energized, and the selected time begins. When the time (T) is completed, the star output relay is de-energized, and the fixed transition time (approximately 100 ms) begins. When the transition time is completed, the delta output relay is energized and remains energized while the relay is supplied. This function requires the continuous application of supply voltage.

Timing diagram



Functions

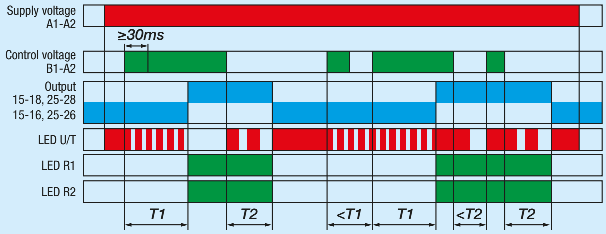
Multifunction Models (ERWT-MF2)

Operating mode

Operating mode

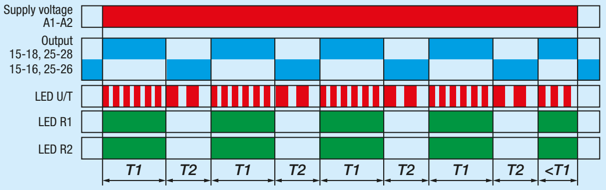
Cb (ON and OFF-delay with control signal) – Timing begins when the supply voltage is applied. When the selected time delay (T) is completed, the output relay is energized and/or de-energized, depending on the current situation. If the supply voltage is interrupted, the output relay is de-energized in case it is energized (after the time delay). If the relay supply voltage is interrupted before the time is completed, the time delay is reset and the output relay won't be energized. This function requires the continuous application of supply voltage.

Timing diagram



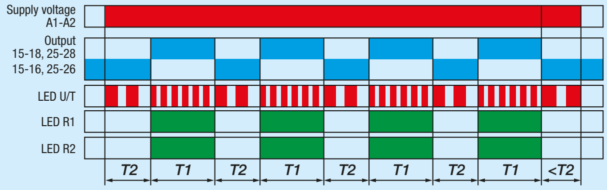
Dc (symmetric flasher, start ON) – Applying the supply voltage, timing begins with times given by T1 (output ON) and T2 (output OFF). The cycle starts with the output relay energized. The times of full scale range T1 and T2 are different. If the supply voltage is interrupted before the time delay is completed, the relay is de-energized and the time delay is reset. The total cycle is given by T = T1+T2. Interrupting the supply voltage with the output energized resets the time delay and de-energizes the output relay. This function requires the continuous application of supply voltage.

Timing diagram



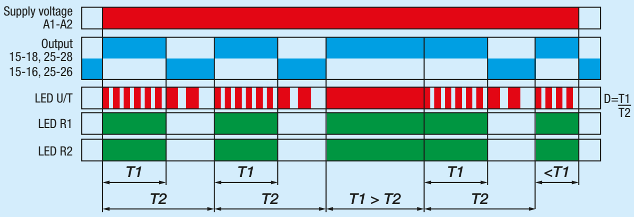
Dd (symmetric flasher, start OFF) – Applying the supply voltage, timing begins with times given by T1 (output ON) and T2 (output OFF). The cycle starts with the output relay de-energized. The times of full scale range T1 and T2 are different. The total cycle is given by T = T1+T2. Interrupting the supply voltage with the output energized resets the time delay and de-energizes the output relay. This function requires the continuous application of supply voltage.

Timing diagram



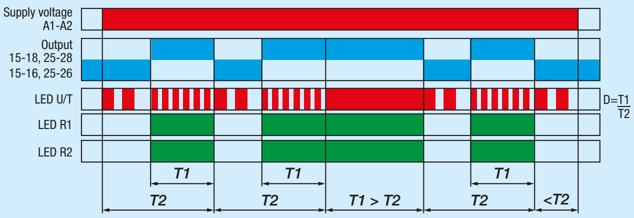
De (percentage flasher, start ON – Applying the supply voltage, the output relay is cyclically activated for a percentage of the cycle time (T). The time the output remains activated is given by t = D.T, where D corresponds to the adjustment percentage (0...100%). The cycle starts with the output relay energized. If the supply voltage is interrupted before the time delay is completed with the output activated, the relay is de-energized and the time delay is reset. This function requires the continuous application of supply voltage.

Timing diagram



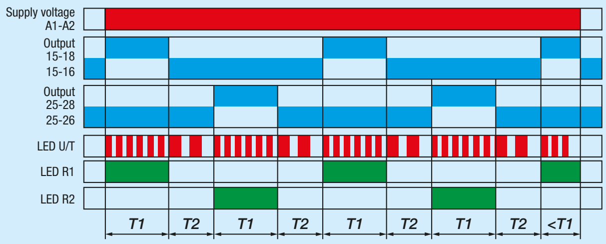
Df (percentage flasher, start OFF – Applying the supply voltage, the output relay is cyclically activated for a percentage of the cycle time (T). The time the output remains activated is given by t = D.T, where D corresponds to the adjustment percentage (0...100%). The cycle starts with the output relay de-energized. If the supply voltage is interrupted before the time delay is completed with the output activated, the relay is de-energized and the time delay is reset. This function requires the continuous application of supply voltage.

Timing diagram



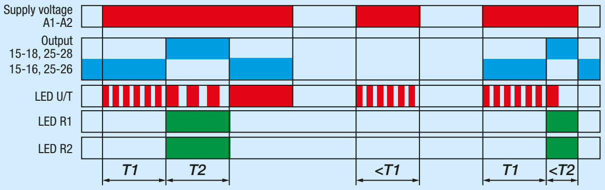
Dg (flasher for motor reversing) – Applying the supply voltage, timing begins with times given by T1 (output ON) and T2 (output OFF), toggling between the R1 and R2 relays each time T1. The cycle begins with the output relay R1 energized and R2 de-energized. The times of full scale range T1 and T2 are different. If the supply voltage is interrupted with the output activated, the output relay R1 is energized, R2 is de-energized, and timing is restarted by T1. This function requires the continuous application of supply voltage.

Timing diagram



Ia (delayed adjustable-length pulse) – The output relay is energized after the time T1 is completed, and it remains activated while time T2 is applied. If the supply voltage is interrupted before the time delay is completed, the relay is de-energized and the time delay is reset, restarting the timing. This function requires the continuous application of supply voltage.

Timing diagram



J (bistable) – The relay switches its output contacts between normally open (NO) and normally closed (NC) and vice versa every pulse of the control signal. If the supply voltage is interrupted with the output activated, the output relay is de-energized. This function is not timed. This function requires the continuous application of supply voltage.

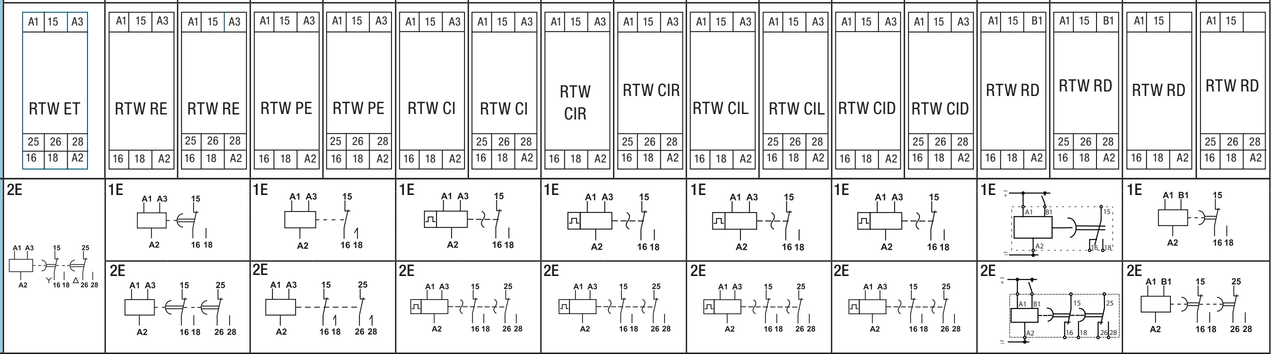
Timing diagram

Wiring Diagram

Single Timing Models

	RTW-ET	RTW-RE		RTW-PE		RTW-CI		RTW-CIR		RTW-CIL		RTW-CID		RTW-RD		RTW-RDI	
	2E	1E	2E	1E	2E	1E	2E	1E	2E	1E	2E	1E	2E	1E	2E	1E	2E	1E	2E

Functions / Wiring diagrams

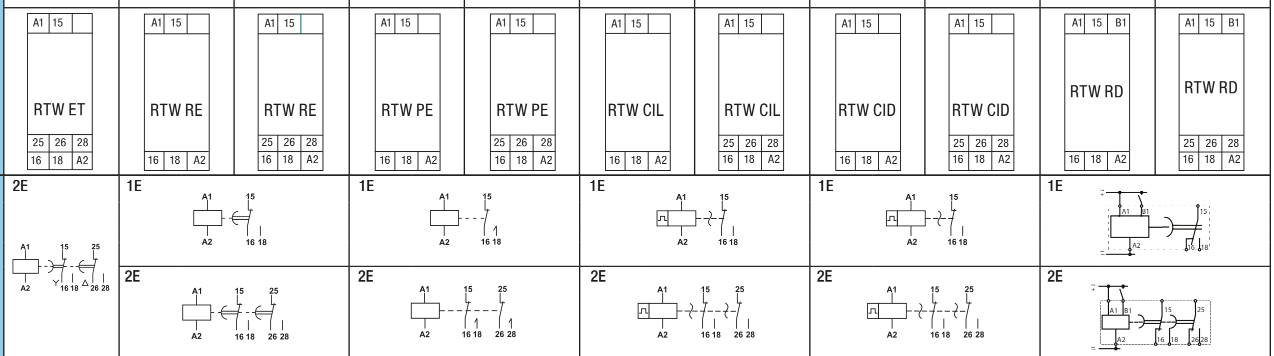


Terminals	RTW-ET	RTW-RE	RTW-PE	RTW-CI	RTW-CIR	RTW-CIL	RTW-CID	RTW-RD	RTW-RDI
	Supply voltage[1]		Supply voltage[1]		Supply voltage[1]		Supply voltage	Control voltage[2]	Supply voltage
	A1 - A2	A3 - A2	A1 - A2	A3 - A2	A1 - A2	A3 - A2	A1(+) - A2(-)	B1(+) - A2(-)	A1 - A2
	24 V ac	24 V dc	24 V ac	24 V dc	24 V ac	24 V dc	24 V dc	24 V dc	24-240 V ac/V dc
	48 V ac	24 V dc	48 V ac	24 V dc	48 V ac	24 V dc	24 V ac	24 V ac	-
	110-130 V ac	24 V dc	110-130 V ac	24 V dc	110-130 V ac	24 V dc	48 V ac	48 V ac	-
	220-240 V ac	24 V dc	220-240 V ac	24 V dc	220-240 V ac	24 V dc	110-130 V ac	110-130 V ac	-
	380-440 V ac	-	24-240 V ac/V dc	-	-	-	220-240 V ac	220-240 V ac	-
	15 - 16 / 18 - output 1								
	25 - 26 / 28 - output 2								

Multifunction Models (MAT / MBT)

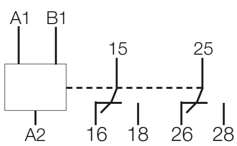
	RTW-ET	RTW-RE		RTW-PE		RTW-CIL		RTW-CID		RTW-RD	
	2E	1E	2E	1E	2E	1E	2E	1E	2E	1E	2E

Functions / Wiring diagrams



Terminals	RTW-ET / RTW-RE / RTW-PE / RTW-CIL / RTW-CID	RTW-RD 1E	RTW-RD 2E
	Supply voltage	Supply voltage	Control voltage[1]
	A1-A2	A1(+) - A2(-)	B1(+) - A2(-)
	24-240 V ac/V dc	24-240 V ac/V dc	24-240 V ac/V dc
	15 - 16 / 18 - output 1		
	25 - 26 / 28 - output 2		

Multifunction Models ERWT (MF1-MF2)

	ERWT-MF1 / MF2	Supply voltage	Wiring diagram	Control voltage
Functions		A1-A2 24-240 V ac / cc		B1-A2 24-240 V ac /cc
	15 - 16 / 18 - output contact 1			
	25 - 26 / 28 - output contact 2			

Notes: 1) In models with two supply voltages, only one must be connected;
2) The same potential must be applied to A1 and B1, polarized.

Specification

Single Timing, Voltage and Function Relay

Function: ON-Delay (RE)

Model	Function	Contacts	Timing	Reference (complete with the supply voltage)
RTW	RE	1NOC	0.1s - 1s	RTW-RE01-U001S-◆
			0.3s - 3s	RTW-RE01-U003S-◆
			1s - 10s	RTW-RE01-U010S-◆
			3s - 30s	RTW-RE01-U030S-◆
			6s - 60s	RTW-RE01-U060S-◆
			10s - 100s	RTW-RE01-U100S-◆
			30s - 300s	RTW-RE01-U300S-◆
			3 - 30min	RTW-RE01-U030M-◆
		2NOC	0.1s - 1s	RTW-RE02-U001S-◆
			0.3s - 3s	RTW-RE02-U003S-◆
			1s - 10s	RTW-RE02-U010S-◆
			3s - 30s	RTW-RE02-U030S-◆
			6s - 60s	RTW-RE02-U060S-◆
			10s - 100s	RTW-RE02-U100S-◆
			30s - 300s	RTW-RE02-U300S-◆
			3 - 30min	RTW-RE02-U030M-◆

Certifications

Code	◆ Supply voltage	
	Terminals (V ac=50/60 Hz)	
	A1-A2	A3-A2
E26	24 V ac	24 V dc
E33	48 V ac	24 V dc
E37	110-130 V ac	24 V dc
E40	220-240 V ac	24 V dc
D71[1)]	380-440 V ac	-

Note: 1) Timing range from 0.1 to 1s not available for this voltage.

Function: Impulse ON (PE)

Model	Function	Contacts	Timing	Reference (complete with the supply voltage)
RTW	CIR	1NOC	0.1s - 1s	RTW-PE01-U001S-◆
			0.3s - 3s	RTW-PE01-U003S-◆
			1s - 10s	RTW-PE01-U010S-◆
			3s - 30s	RTW-PE01-U030S-◆
			6s - 60s	RTW-PE01-U060S-◆
			10s - 100s	RTW-PE01-U100S-◆
			30s - 300s	RTW-PE01-U300S-◆
			3 - 30min	RTW-PE01-U030M-◆
		2NOC	0.1s - 1s	RTW-PE02-U001S-◆
			0.3s - 3s	RTW-PE02-U003S-◆
			1s - 10s	RTW-PE02-U010S-◆
			3s - 30s	RTW-PE02-U030S-◆
			6s - 60s	RTW-PE02-U060S-◆
			10s - 100s	RTW-PE02-U100S-◆
			30s - 300s	RTW-PE02-U300S-◆
			3 - 30min	RTW-PE02-U030M-◆

Certifications

Code	◆ Supply voltage	
	Terminals (V ac=50/60 Hz)	
	A1-A2	A3-A2
E26	24 V ac	24 V dc
E33	48 V ac	24 V dc
E37	110-130 V ac	24 V dc
E40	220-240 V ac	24 V dc

Function: OFF-Delay with Control Signal (RD)

Model	Function	Contacts	Timing	Reference (complete with the supply voltage)
RTW	RD	1NOC	0.1s - 1s	-
			0.3s - 3s	RTW-RD01-U003S-◆
			1s - 10s	RTW-RD01-U010S-◆
			3s - 30s	RTW-RD01-U030S-◆
			6s - 60s	RTW-RD01-U060S-◆
			10s - 100s	RTW-RD01-U100S-◆
			30s - 300s	RTW-RD01-U300S-◆
			3 - 30min	RTW-RD01-U030M-◆
		2NOC	0.1s - 1s	-
			0.3s - 3s	RTW-RD02-U003S-◆
			1s - 10s	RTW-RD02-U010S-◆
			3s - 30s	RTW-RD02-U030S-◆
			6s - 60s	RTW-RD02-U060S-◆
			10s - 100s	RTW-RD02-U100S-◆
			30s - 300s	RTW-RD02-U300S-◆
			3 - 30min	RTW-RD02-U030M-◆

Certifications

Code	◆ Supply voltage	
	Terminals (V ac=50/60 Hz)	
	A1-A2	A3-A2
D02	24 V ac	-
D07	48 V ac	-
D61	110-130 V ac	-
D66	220-240 V ac	-
C03	24 V dc	-

Note: for application in generator sets, frequency inverters with 12-pulse or regenerative rectifiers, electronic power controllers (dimmers or the like) or where a high level of harmonic currents may be present (above the recommendation of IEEE519), we recommend the ERWT, MAT or MBT relay.

Specification

Single Timing Relays

Function: OFF-Delay (RDI)

Model	Function	Contacts	Timing	Reference (complete with the supply voltage)
RTW	RDI	1NOC	0.1s - 1s	-
			0.3s - 3s	RTW-RDI01-U003S-◆
			1s - 10s	RTW-RDI01-U010S-◆
			3s - 30s	RTW-RDI01-U030S-◆
			6s - 60s	RTW-RDI01-U060S-◆
			10s - 100s	RTW-RDI01-U100S-◆
			30s - 300s	RTW-RDI01-U300S-◆
			1 - 10min	RTW-RDI01-U010M-◆
		2NOC	0.1s - 1s	-
			0.3s - 3s	RTW-RD02-U003S-◆
			1s - 10s	RTW-RD02-U010S-◆
			3s - 30s	RTW-RD02-U030S-◆
			6s - 60s	RTW-RD02-U060S-◆
			10s - 100s	RTW-RD02-U100S-◆
			30s - 300s	RTW-RD02-U300S-◆
			1 - 10min	RTW-RD02-U010M-◆

Certifications

Code	◆ Supply voltage Terminals (V ac=50/60 Hz)	
	A1-A2	A3-A2
E05	24-240 V ac / V dc	-

Function: Flasher with Two Settings and Start ON (CI)

Model	Function	Contacts	Timing	Reference (complete with the supply voltage)
RTW	CI	1NOC	0.1s - 1s	-
			0.3s - 3s	RTW-CI01-U003S-◆
			1s - 10s	RTW-CI01-U010S-◆
			3s - 30s	RTW-CI01-U030S-◆
			6s - 60s	RTW-CI01-U060S-◆
			10s - 100s	RTW-CI01-U100S-◆
			30s - 300s	RTW-CI01-U300S-◆
			3 - 30min	RTW-CI01-U030M-◆
		2NOC	0.1s - 1s	-
			0.3s - 3s	RTW-CI02-U003S-◆
			1s - 10s	RTW-CI02-U010S-◆
			3s - 30s	RTW-CI02-U030S-◆
			6s - 60s	RTW-CI02-U060S-◆
			10s - 100s	RTW-CI02-U100S-◆
			30s - 300s	RTW-CI02-U300S-◆
			3 - 30min	RTW-CI02-U030M-◆

Certifications

Code	◆ Supply voltage Terminals (V ac=50/60 Hz)	
	A1-A2	A3-A2
E26	24 V ac	24 V dc
E33	48 V ac	24 V dc
E37	110-130 V ac	24 V dc
E40	220-240 V ac	24 V dc

Function: Flasher with Two Settings and Start OFF (CIR)

Model	Function	Contacts	Timing	Reference (complete with the supply voltage)
RTW	CIR	1NOC	0.1s - 1s	-
			0.3s - 3s	RTW-CIR01-U003S-◆
			1s - 10s	RTW-CIR01-U010S-◆
			3s - 30s	RTW-CIR01-U030S-◆
			6s - 60s	RTW-CIR01-U060S-◆
			10s - 100s	RTW-CIR01-U100S-◆
			30s - 300s	RTW-CIR01-U300S-◆
			180s - 1,800s	RTW-CIR01-U030M-◆
		2NOC	0.1s - 1s	-
			0.3s - 3s	RTW-CIR02-U003S-◆
			1s - 10s	RTW-CIR02-U010S-◆
			3s - 30s	RTW-CIR02-U030S-◆
			6s - 60s	RTW-CIR02-U060S-◆
			10s - 100s	RTW-CIR02-U100S-◆
			30s - 300s	RTW-CIR02-U300S-◆
			180s - 1,800s	RTW-CIR02-U030M-◆

Certifications

Code	◆ Supply voltage Terminals (V ac=50/60 Hz)	
	A1-A2	A3-A2
E26	24 V ac	24 V dc
E33	48 V ac	24 V dc
E37	110-130 V ac	24 V dc
E40	220-240 V ac	24 V dc

Note: for application in generator sets, frequency inverters with 12-pulse or regenerative rectifiers, electronic power controllers (dimmers or the like) or where a high level of harmonic currents may be present (above the recommendation of IEEE519), we recommend the ERWT, MAT or MBT relay.

Specification

Single Timing Relays

Function: Flasher with One Setting and Start ON (CIL)

Model	Function	Contacts	Timing	Reference (complete with the supply voltage)
RTW	CIL	1NOC	0.1s - 1s	RTW-CIL01-U001S-◆
			0.3s - 3s	RTW-CIL01-U003S-◆
			1s - 10s	RTW-CIL01-U010S-◆
			3s - 30s	RTW-CIL01-U030S-◆
			6s - 60s	RTW-CIL01-U060S-◆
			10s - 100s	RTW-CIL01-U100S-◆
			30s - 300s	RTW-CIL01-U300S-◆
			3 - 30min	RTW-CIL01-U030M-◆
		2NOC	0.1s - 1s	RTW-CIL02-U001S-◆
			0.3s - 3s	RTW-CIL02-U003S-◆
			1s - 10s	RTW-CIL02-U010S-◆
			3s - 30s	RTW-CIL02-U030S-◆
			6s - 60s	RTW-CIL02-U060S-◆
			10s - 100s	RTW-CIL02-U100S-◆
			30s - 300s	RTW-CIL02-U300S-◆
			3 - 30min	RTW-CIL02-U030M-◆

Certifications

Code	◆ Supply voltage	
	Terminals (V ac=50/60 Hz)	
	A1-A2	A3-A2
E26	24 V ac	24 V dc
E33	48 V ac	24 V dc
E37	110-130 V ac	24 V dc
E40	220-240 V ac	24 V dc

Function: Flasher with One Setting and Start OFF (CID)

Model	Function	Contacts	Timing	Reference (complete with the supply voltage)
RTW	CID	1NOC	0.1s - 1s	RTW-CID01-U001S-◆
			0.3s - 3s	RTW-CID01-U003S-◆
			1s - 10s	RTW-CID01-U010S-◆
			3s - 30s	RTW-CID01-U030S-◆
			6s - 60s	RTW-CID01-U060S-◆
			10s - 100s	RTW-CID01-U100S-◆
			30s - 300s	RTW-CID01-U300S-◆
			3 - 30min	RTW-CID01-U030M-◆
		2NOC	0.1s - 1s	RTW-CID02-U001S-◆
			0.3s - 3s	RTW-CID02-U003S-◆
			1s - 10s	RTW-CID02-U010S-◆
			3s - 30s	RTW-CID02-U030S-◆
			6s - 60s	RTW-CID02-U060S-◆
			10s - 100s	RTW-CID02-U100S-◆
			30s - 300s	RTW-CID02-U300S-◆
			3 - 30min	RTW-CID02-U030M-◆

Certifications

Code	◆ Supply voltage	
	Terminals (V ac=50/60 Hz)	
	A1-A2	A3-A2
E26	24 V ac	24 V dc
E33	48 V ac	24 V dc
E37	110-130 V ac	24 V dc
E40	220-240 V ac	24 V dc

Note: for application in generator sets, frequency inverters with 12-pulse or regenerative rectifiers, electronic power controllers (dimmers or the like) or where a high level of harmonic currents may be present (above the recommendation of IEEE519), we recommend the ERWT, MAT or MBT relay.

Specification

Single Timing Relays

Function: Star-Delta (ET)

Model	Function	Contacts	Timing	Reference (complete with the supply voltage)
RTW	ET	2NOC	3s - 30s	RTW-ET02-U030S-◆

◆ Supply voltage		
Code	Terminals (V ac=50/60 Hz)	
	A1-A2	A3-A2
E26	24 V ac	24 V dc
E33	48 V ac	24 V dc
E37	110-130 V ac	24 V dc
E40	220-240 V ac	24 V dc
E05	24-240 V ac / V dc	-

Certifications

Note: for application in generator sets, frequency inverters with 12-pulse or regenerative rectifiers, electronic power controllers (dimmers or the like) or where a high level of harmonic currents may be present (above the recommendation of IEEE519), we recommend the ERWT, MAT or MBT relay.

Multiple Timing Relays

Models: MAT or MBT (Multiple Timing), Multi Voltage and Single Function

Model	Function	Contacts	Timing	Reference
RTW	ON-delay (RE)	1NOC	0.1 - 10min	RTW-RE01-MATE05
			0.2 - 150h	RTW-RE01-MBTE05
		2NOC	0.1 - 10min	RTW-RE02-MATE05
			0.2 - 150h	RTW-RE02-MBTE05
	Impulse ON (PE)	1NOC	0.1 - 10min	RTW-PE01-MATE05
			0.2 - 150h	RTW-PE01-MBTE05
		2NOC	0.1 - 10min	RTW-PE02-MATE05
			0.2 - 150h	RTW-PE02-MBTE05
	OFF-delay with control signal (RD)	1NOC	0.1 - 10min	RTW-RD01-MATE05
			0.2 - 150h	RTW-RD01-MBTE05
		2NOC	0.1 - 10min	RTW-RD02-MATE05
			0.2 - 150h	RTW-RD02-MBTE05
	Flasher with one setting and start ON (CIL)	1NOC	0.1 - 10min	RTW-CIL01-MATE05
			0.2 - 150h	RTW-CIL01-MBTE05
		2NOC	0.1 - 10min	RTW-CIL02-MATE05
			0.2 - 150h	RTW-CIL02-MBTE05
	Flasher with one setting and start OFF (CID)	1NOC	0.1 - 10min	RTW-CID01-MATE05
			0.2 - 150h	RTW-CID01-MBTE05
		2NOC	0.1 - 10min	RTW-CID02-MATE05
			0.2 - 150h	RTW-CID02-MBTE05
	Star-delta (ET)	2NOC	0.1 - 10min	RTW-ET02-MATE05

Certifications

Supply voltages		
Code	RE, PE, CIL, CID, ET Models	
	A1-A2	A3-A2
E05	24-240 V ac / V dc	-
Supply voltages		
Code	RD Model	
	A1-A2	A3-A2
E05	24-240 V ac / V dc	-

Specification

Multifunction Relays

Models: MF1 / MF2 (Multifunction), Multiple Voltage and Multiple Timing

Reference	Supply voltage	Contacts	Timing
ERWT-MF1-02MT1E05	24-240 V ac/ V dc	2NOC	0.1s - 10 days
ERWT-MF2-02MT1E05			

Notes: The MF1 model has 8 configurable functions:
A - On-delay
Ba - ON-delay with control signal
Ca - ON and OFF-delay with control signal
Da - Symmetric flasher, start ON
Db - Symmetric flasher, start OFF
E - Impulse ON
Fa - Impulse ON with control signal
G - Star-delta

The MF2 model has 8 configurable functions:
Cb - ON and OFF-delay with control signal
Dc - Symmetric flasher, start ON
Dd - Asymmetric flasher, start OFF
De - Percentage flasher, start ON
Df - Percentage flasher, start OFF
Dg - Flasher for motor reversing
J - Bistable
Ia - Delayed adjustable-length pulse

Certifications

Technical Data

			Model								
			RTW-xxx0x-UxxxxE26	RTW-xxx0x-UxxxxD02	RTW-xxx0x-UxxxxE33	RTW-xx0x-UxxxxD07	RTW-xxx0x-UxxxxE37	RTW-xxx0x-UxxxxD61	RTW-xxx0x-UxxxxE40	ERWT-MF1-02MT1E05	ERWT-MF2-02MT1E05
Inputs	Supply voltage (Us)[1]	A1-A2	24 V ac		48 V ac		110 to 130 V ac		220 to 240 V ac	24 to 240 V ac / V dc	
		A3-A2	24 V dc	-	24 V dc	-	24 V dc	-	24 V dc	-	-
	Rated supply voltage tolerance		0.85 to 1.10 x Us								
	Rated frequency		50 / 60 Hz								
	Maximum consumption		70 mA at 240 V ac (Us)							80 mA at 240 V ac (Us)	
	Control supply voltage (RD function)[2]	B1-A2	Voltage-related triggering (Us)								
	Rated insulation voltage (U_i)		300 V								
Time adjustment	Minimum time for reset		100ms								
	Minimum ON time		50ms								
	Scale accuracy (full scale)		±5%[1]								
	Repeatability accuracy (full scale)		±2%								
	Changeover time Y - Δ (star-delta function)		100ms ±20%								
Outputs	Capacity of the output contacts (I_e)		AC-12 (resistive) at 250 V ac: 5 A AC-15 at 230 V ac: 3 A DC-13 at 24 V dc: 1 A DC-13 at 48 V dc: 0.45 A DC-13 at 60 V dc: 0.35 A DC-13 at 125 V dc: 0.2 A DC-13 at 250 V dc: 0.1 A							AC-12 (resistive) at 250 V ac: 5 A AC-15 at 230 V ac: 3 A DC-13 at 24 V dc: 1 A DC-13 at 48 V dc: 0.45 A DC-13 at 60 V dc: 0.35 A DC-13 at 125 V dc: 0.2 A DC-13 at 250 V dc: 0.1 A B300 R300	
	Rated thermal current (I_{th})		10 A for AC 1 A for DC								
	Fuse (class gL/gG)		4 A								
	Mechanical lifespan		30 x 10^6 switching cycles								
Characteristics	Ambient temperature -Operation -Storage		-5 ºC to +60 ºC -40 ºC to +85 ºC								
	Degree of protection		Enclosure: IP20 Terminals: IP20								
	Connection section (min. to max.) - Cable without end sleeve		1 x (0.5 to 2.5) mm^2 2 x (0.5 to 1.5) mm^2								
	- Cable with end sleeves		1 x (0.5 to 1.5) mm^2 2 x (0.5 to 1.5) mm^2								
	- AWG-Rigid Wire		2 x (20 to 14) AWG								
	Tightening torque		0.8 to 1.2 N.m								
	Terminal screw		7 to 10.6 Lb.in								
	Assembly position		Any								
	Shock resistance		15 g / 11ms								
	Vibration resistance		10 to 55 Hz / 0.35 mm								
	Weight		0.08 kg - models with 1NOC 0.095 kg - models with 2NOC								
	Pollution degree		2								
	Overvoltage category		II								

Note: 1) For the ERWT models, under extreme voltage and temperature conditions, the scale accuracy may vary up to +/- 10% (full scale).

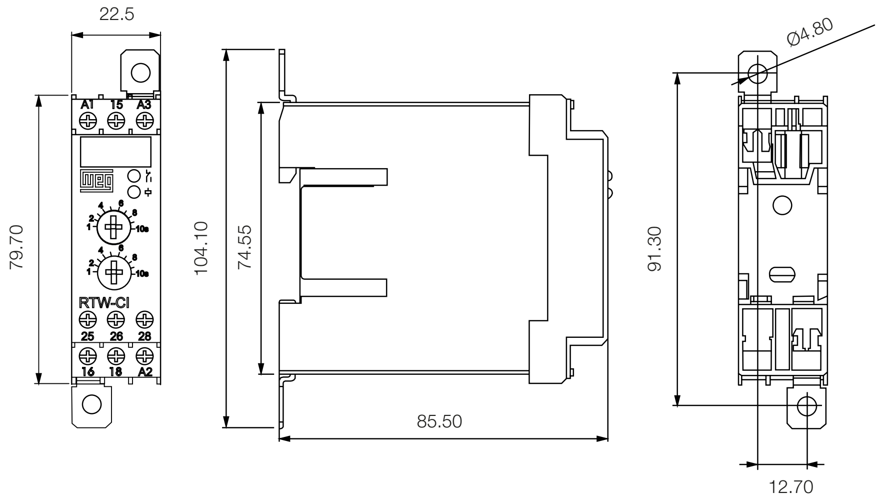
Technical Data

<table>
<tr><td colspan="3" rowspan="2"></td><td colspan="5">Model</td></tr>
<tr><td>RTW-xxx0x-UxxxxD66</td><td>RTW-xxx0x-UxxxxC03</td><td>RTW-RDI0X-UxxxE05</td><td>RTW-xxx0X-MxTE05</td><td>RTW-xx0X-UxxD71</td></tr>
<tr><td rowspan="7">Inputs</td><td rowspan="2">Supply voltage (Us)[1]</td><td>A1-A2</td><td>220 to 240 V ac</td><td>24 V dc</td><td>24 to 240
V ac / V dc</td><td>24 to 240
V ac / V dc</td><td>380 to 440 V ac</td></tr>
<tr><td>A3-A2</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="2">Rated supply voltage tolerance</td><td colspan="5">0.85 to 1.1 x Us</td></tr>
<tr><td colspan="2">Frequency</td><td colspan="5">50 / 60 Hz</td></tr>
<tr><td colspan="2">Maximum consumption</td><td colspan="2">70 mA at 240 V ac (Us)</td><td>25 mA at 240 V ac (Us)</td><td>15 mA at
240 V ac (Us)</td><td>70 mA at 440 V ac (Us)</td></tr>
<tr><td>Control supply voltage
(RD function)[2]</td><td>B1-A2</td><td colspan="2">Voltage-related triggering (Us)</td><td>-</td><td>Voltage-related triggering (Us)</td><td>-</td></tr>
<tr><td colspan="2">Rated insulation voltage (U_i)</td><td colspan="4">300 V</td><td>600 V</td></tr>
<tr><td rowspan="5">Time adjustment</td><td colspan="2">Minimum time for reset</td><td colspan="2">100ms</td><td>200ms</td><td>500ms</td><td>100ms</td></tr>
<tr><td colspan="2">Minimum ON time</td><td colspan="2">50ms</td><td>1s for Us = 220
V ac / V dc
1.6s for Us = 24
V ac / V dc</td><td>100ms</td><td>-</td></tr>
<tr><td colspan="2">Scale accuracy (full scale)</td><td colspan="5">±5%</td></tr>
<tr><td colspan="2">Repeatability accuracy (full scale)</td><td colspan="5">±2%</td></tr>
<tr><td colspan="2">Changeover time Y - Δ
(star-delta function)</td><td colspan="2">100ms ±20%</td><td>-</td><td>50ms ±20%</td><td>100ms ±20%</td></tr>
<tr><td rowspan="4">Outputs</td><td colspan="2">Capacity of the output contacts (I_e)</td><td colspan="4">AC-12 (resistive) at 250 V ac: 5 A
AC-15 at 230 V ac: 3 A
DC-13 at 24 V dc: 1 A
DC-13 at 48 V dc: 0.45 A
DC-13 at 60 V dc: 0.35 A
DC-13 at 125 V dc: 0.2 A
DC-13 at 250 V dc: 0.1 A
A300
R300</td><td>AC-12 (resistive)
at 250 V ac: 10 A
AC-15 at 120 V ac: 6 A
AC-15 at 240 V ac: 3 A
AC-15 at 380 V ac: 1.9 A
AC-15 at 480 V ac: 1.5 A
DC-13 at 125 V dc: 0.2 A
DC-13 at 125 V dc: 0.1 A
A600
R300</td></tr>
<tr><td colspan="2">Rated thermal current (I_{th})</td><td colspan="5">10 A for AC
1 A for DC</td></tr>
<tr><td colspan="2">Fuse (class gL/gG)</td><td colspan="5">4 A</td></tr>
<tr><td colspan="2">Mechanical lifespan</td><td colspan="5">30 x 10^6 switching cycles</td></tr>
<tr><td rowspan="13">Characteristics</td><td colspan="2">Ambient temperature
-Operation
-Storage</td><td colspan="5">-5 ºC to +60 ºC
-40 ºC to +85 ºC</td></tr>
<tr><td colspan="2">Degree of protection</td><td colspan="5">Enclosure: IP20
Terminals: IP20</td></tr>
<tr><td colspan="2">Connection section (min. to max.)
- Cable without end sleeve</td><td colspan="5">1 x (0.5 to 2.5) mm^2
2 x (0.5 to 1.5) mm^2</td></tr>
<tr><td colspan="2">- Cable with end sleeves</td><td colspan="5">1 x (0.5 to 1.5) mm^2
2 x (0.5 to 1.5) mm^2</td></tr>
<tr><td colspan="2">- AWG-Rigid Wire</td><td colspan="5">2 x (20 to 14) AWG</td></tr>
<tr><td colspan="2">Tightening torque</td><td colspan="5">0.8 to 1.2 N.m</td></tr>
<tr><td colspan="2">Terminal screw</td><td colspan="5">7 to 10.6 Lb.in</td></tr>
<tr><td colspan="2">Assembly position</td><td colspan="5">Any</td></tr>
<tr><td colspan="2">Shock resistance</td><td colspan="5">15 g / 11ms</td></tr>
<tr><td colspan="2">Vibration resistance</td><td colspan="5">10 to 55 Hz / 0.35 mm</td></tr>
<tr><td colspan="2">Weight</td><td colspan="5">0.08 kg - models with 1NOC
0.095 kg - models with 2NOC</td></tr>
<tr><td colspan="2">Pollution degree</td><td colspan="5">2</td></tr>
<tr><td colspan="2">Overvoltage category</td><td colspan="5">II</td></tr>
</table>

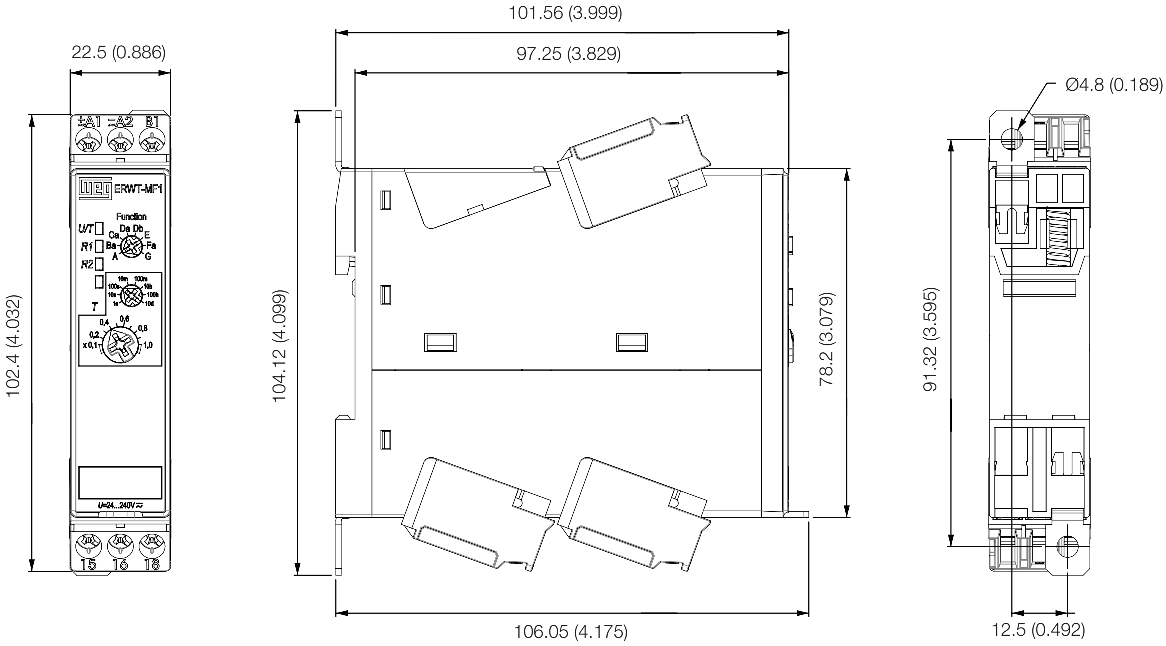
Notes: 1) In the versions with two operational voltages, only one must be connected;
2) The same potential must be applied to A1 and B1, polarized.

Dimensions (mm)

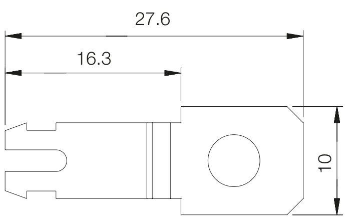
Single Timing or Multiple Timing Models



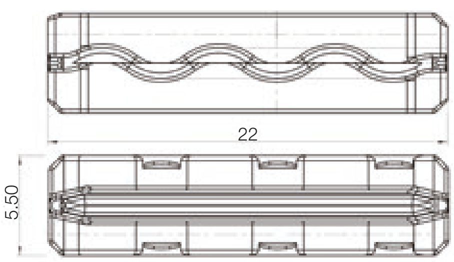
Multifunction Models (MF1 / MF2)



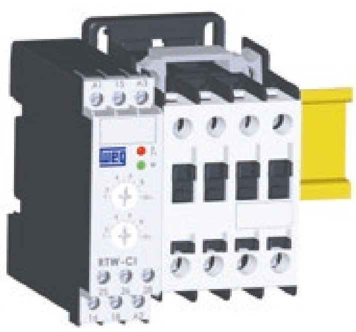
Accessories



PLMP Adapter



MARC adapter for direct mounting on WEG contactors



VOLTAGE
MONITORS

They are electronic devices intended to monitor three-phase systems and interrupt the process operation whenever a failure occurs. Designed according to international standards, they are available in 22.5 mm wide housings and can be mounted on DIN rails 35 mm or fixed with screws (PLMP accessory required), being a compact and safe solution.

RPW-FF - Phase Loss Function

It is intended to protect three-phase systems against the loss of one phase (without neutral). For monitoring the neutral, a bridge must be provided between terminals A and B; thus the RPW-FF will monitor the phase loss and also the neutral voltage (terminal N).

Installation

It is directly connected to the three phases (terminals L1, L2 and L3) of the power grid to be monitored (connect the neutral if applicable).

Operation

The output relay switches the contacts to the operation position (closing terminals 15-18), and the red LED (relay) and green LED (supply voltage) will switch on.
Adjust the sensitivity of the line voltage.
If one of the phases drops below the percentage limit set on the dials, the coil output contacts will be de-energized, opening contacts 15-18, and the red LED will turn OFF.

Note: The RPW-FF protects against ghost phase - In the monitoring of an electric motor, the phase loss makes the remaining phases induce a ghost phase on the winding coil of the respective phase, raising the current of the other two phase and overheating the motor. The winding with induced voltage works as a voltage generator (ghost phase).

Selection

RPW - FF - D70

- RPW: WEG Protective / Monitoring
- FF: Phase loss function
- D70: Power supply selection

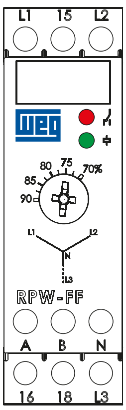
Power supply selection
D66 = 220-240 V ac 50/60 Hz
D70 = 380-415 V ac 50/60 Hz
D74 = 440-480 V ac 50/60 Hz

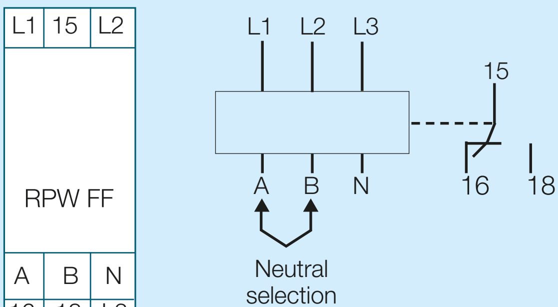
Certifcations

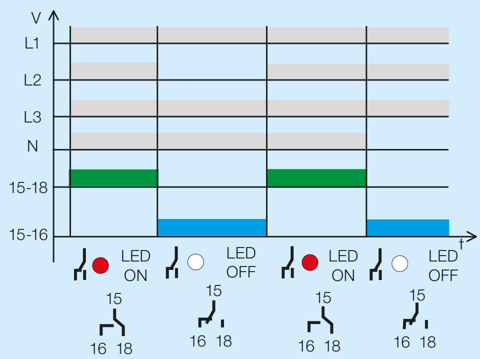
Specification

Supply voltage (L1-L3-L3) 50/60 Hz	Reference
220-240 V ac	RPW-FF-D66
380-415 V ac	RPW-FF-D70
440-480 V ac	RPW-FF-D74

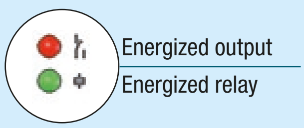
Wiring Diagram







The RPW protective relay has LEDs for state indication, as shown on the right:



Note: for application in generator sets, frequency inverters with 12-pulse or regenerative rectifiers, electronic power controllers (dimmers or the like) or where a high level of harmonic currents may be present (above the recommendation of IEEE519), we recommend the ERWM relay.

RPW-SF - Phase Sequence Function

It is intended to protect three-phase systems against the inversion of the phase sequence (L1-L2-L3).

Installation

It is directly connected to the three phases (terminals L1, L2 and L3) of the power grid to be monitored.

Operation

If the phase sequence is correct, the output relay switches the contacts to the operation position (closing terminals 15-18), and the red LED (relay) and green LED (power supply) will switch on.

Certifications

Selection

RPW - SF - D70

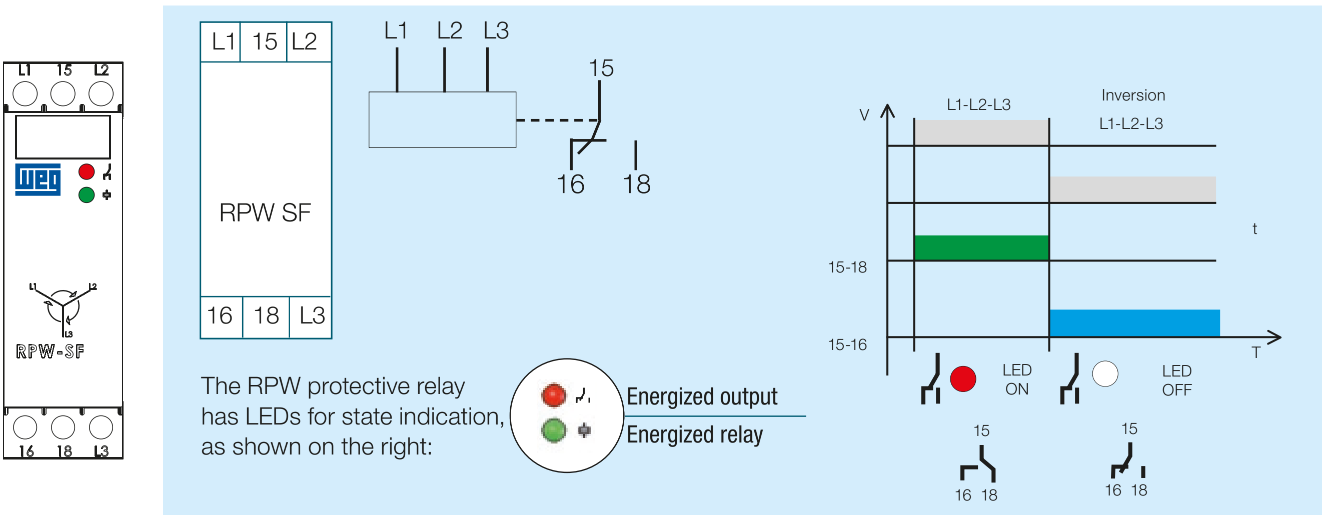
- RPW: WEG Protective / Monitoring
- SF: Phase sequence function
- D70: Power supply selection

Power supply selection
D66 = 220-240 V ac 50/60 Hz
D70 = 380-415 V ac 50/60 Hz
D74 = 440-480 V ac 50/60 Hz

Specification

Supply voltage (L1-L2-L3) 50/60 Hz	Reference
220-240 V ac	RPW-SF-D66
380-415 V ac	RPW-SF-D70
440-480 V ac	RPW-SF-D74

Wiring Diagram



Note: for application in generator sets, frequency inverters with 12-pulse or regenerative rectifiers, electronic power controllers (dimmers or the like) or where a high level of harmonic currents may be present (above the recommendation of IEEE519), we recommend the ERWM relay.

RPW-FSF - Phase Loss and Phase Sequence Function

It is intended to protect three-phase systems against phase loss and phase inversion. For applications with neutral, a bridge must be provided between terminals A and B. The RPW-FSF will monitor against phase loss and also the voltage on the neutral, which must be connected.

Installation
It is directly connected to the three phases (terminals L1, L2 and L3) of the power grid to be monitored (connect the neutral if applicable).

Operation
Energize the relay and observe if the green LED (power supply) and the red LED (relay) turn on. If they do not switch on, check for voltage between phases L1, L2 and L3 (including in relation to the neutral if applicable), and if they are in the correct sequence.

Certifications

Selection

RPW - FSF - D70

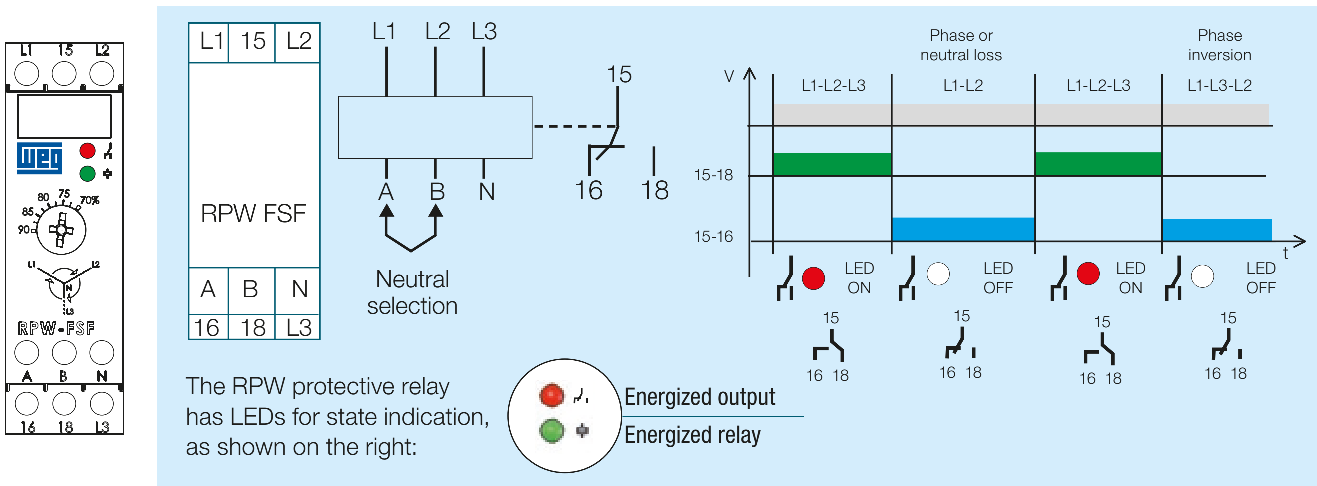
- RPW: WEG Protective / Monitoring
- FSF: Phase loss and phase
- D70:

Power supply selection
D66 = 220-240 V ac 50/60 Hz
D70 = 380-415 V ac 50/60 Hz
D74 = 440-480 V ac 50/60 Hz

Specification

Supply voltage (L1-L2-L3) 50/60 Hz	Reference
220-240 V ac	RPW-FSF-D66
380-415 V ac	RPW-FSF-D70
440-480 V ac	RPW-FSF-D74

Wiring Diagram



Note: for application in generator sets, frequency inverters with 12-pulse or regenerative rectifiers, electronic power controllers (dimmers or the like) or where a high level of harmonic currents may be present (above the recommendation of IEEE519), we recommend the ERWM relay.

RPW-SS - Undervoltage and Overvoltage Function

With this function, the RPW monitors the minimum and maximum voltage variations within which a three-phase power supply can operate. Whenever an under or overvoltage condition is present, the relay will switch its output in order to interrupt the operation of the monitored motor or process.

Note: the RPW SS is suitable for line frequencies of 50/60 Hz.

Installation

It is directly connected to the three phases (terminals L1, L2 and L3) of the power grid to be monitored.

Operation

If the voltage on terminals A1 and A2 is correct, the output relay is energized (contacts 15-18 close). If the monitored voltage (supply voltage) is below or above the adjusted limits for undervoltage and overvoltage, respectively, the output relay is de-energized (contacts 15-18 open). The output relay is energized again when the voltage returns to an acceptable value.

Certifications

Selection

RPW - SS M - D23

- RPW: WEG Protective / Monitorin
- SS: Relay undervoltage and overvoltage function
- M: Supply voltage: (blank) - Three-phase / M - Single-phase[1]
- D23: Power supply selection

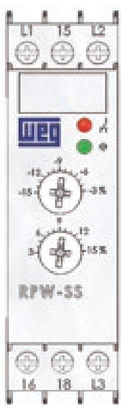
Power supply selection	
D77 = 208 V ac 50/60 Hz	D34 = 400 V ac 50/60 Hz
D23 = 220 V ac 50/60 Hz	D35 = 415 V ac 50/60 Hz
D24 = 230 V ac 50/60 Hz	D36 = 440 V ac 50/60 Hz
D25 = 240 V ac 50/60 Hz	D38 = 460 V ac 50/60 Hz
D33 = 380 V ac 50/60 Hz	D39 = 480 V ac 50/60 Hz

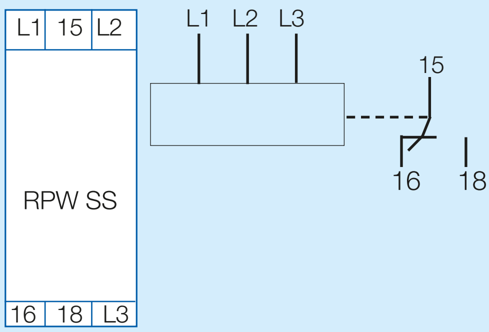
Specification

Supply voltage (L1-L2-L3) 50/60 Hz	Reference
208 V ac	RPW-SS-D77
220 V ac	RPW-SS-D23
230 V ac	RPW-SS-D24
240 V ac	RPW-SS-D25
380 V ac	RPW-SS-D33

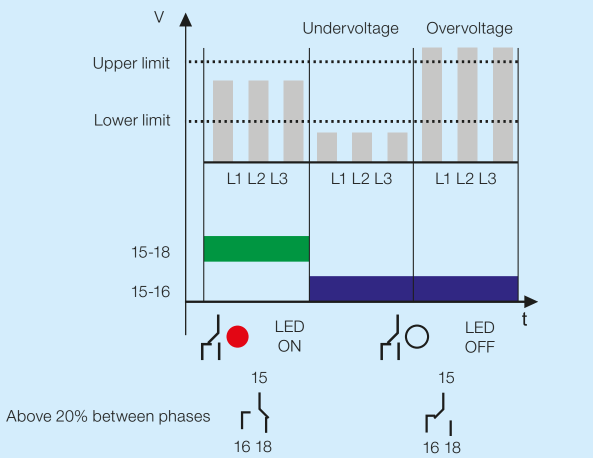
Supply voltage (L1-L2-L3) 50/60 Hz	Reference
400 V ac	RPW-SS-D34
415 V ac	RPW-SS-D35
440 V ac	RPW-SS-D36
460 V ac	RPW-SS-D38
480 V ac	RPW-SS-D39
220 V ac (single-phase)	RPW-SSM-D23

Wiring Diagram





Red	ON	Normal operation
	OFF	Undervoltage, Overvoltage and Phase loss
Green	ON	Supply voltage
	OFF	Without supply voltage



Notes: 1) Available only for voltage D23 (220 V ac - 50/60 Hz). Pending certifications.
For application in generator sets, frequency inverters with 12-pulse or regenerative rectifiers, electronic power controllers (dimmers or the like) or where a high level of harmonic currents may be present (above the recommendation of IEEE519), we recommend the ERWM relay.

RPW-PTC - Temperature Variation Monitoring via PTC Function

It is intended to monitor the temperature variation in motors or generators in machines in general equipped with PTC temperature sensors. It has digital electronics, which provides high accuracy and noise immunity.

Installation

It must be connected in series to PTC sensors (maximum 3). The RPW has a test device for the PTC sensor. In case it is not connected or it is in a fault state, the LED will indicate (LED will flash).

Operation

When it is energized, if the temperature is below the tripping value, the output relay will switch (energize) without delay, switching ON the red LED. In case the temperature rises above the limit, a sudden variation will occur in the PTC resistance, and the output relay will de-energize (red LED switches OFF). The relay will be energized again as soon as the temperature returns to the normal values.

Certifications

Selection

RPW - PTC - E05

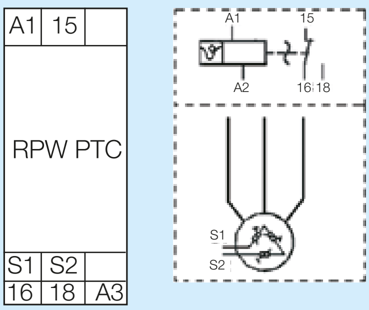
RPW	PTC	E05
WEG Protective / Monitoring Relay	PTC sensor function	Power supply selection E05 = 24-240 V ac / V dc

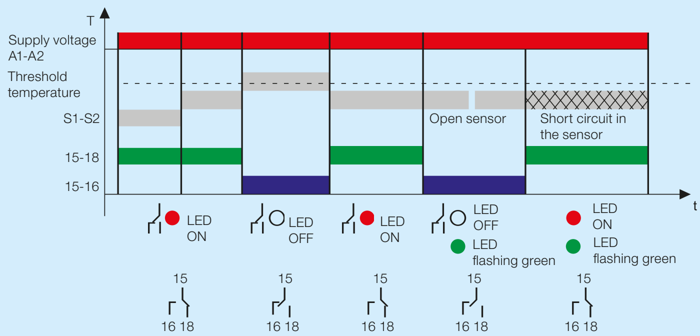
Specification

Power supply (L1-L2-L3)	Reference
24-240 V ac 50/60 Hz or 24-240 V dc	RPW-PTC-E05

Note: PTC sensor not included.

Wiring Diagram





Terminals

A1 - A2	Supply voltage
S1 - S2	PTC sensor input
15 - 16 - 18	Output

	ON	Normal operation
	OFF	Undervoltage, Overvoltage and Phase loss
	ON	Supply voltage
	OFF	Without supply voltage
	Flashing	Fault in the PTC sensor

Notes: It is recommended the use of three PTC sensors in series, according to IEC 60947-8.
The tripping temperature depends on the used PTC curve.

ERWM-VM1 / VM2

The ERWM controls the faults in the voltage monitoring within which a three-phase supply voltage can operate. Whenever a failure in the power grid occurs, the relay will switch its output in order to interrupt the operation of the monitored motor or process.

Installation

It is directly connected to the three phases (L1, L2 and L3) of the power grid to be monitored (connect the neutral if applicable).

Operation

If the voltage on terminals L1, L2 and L3 is correct, the output relay is energized (contacts 15-18 close). If the monitored supply voltage is in the adjusted operating range, the output relay is de-energized (contacts 15-18 open). The output relay is energized again when the voltage returns to an acceptable value.

Certifications

Selection

ERWM - VM1 - 01 - D90

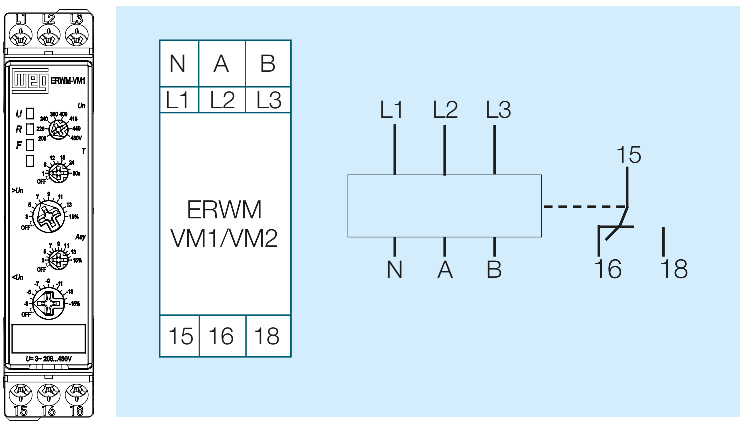
- ERWM: WEG electronic monitoring relay
- VM1: Models
- 01: Number of contacts
- D90: Supply voltage

Models:
VM1: PF-Phase loss, PS-Phase sequence, >Un-Overvoltage/<Un-Undervoltage, Asy-Unbalance, ND-Neutral Detection
VM2: PF-Phase loss, Un-Overvoltage/Undervoltage, Asy-Unbalance, ND-Neutral Detection

Specification

Reference	Supply voltage
ERWM-VM1-01D90	208-480 V ac 50/0 Hz (L1-L2-L3)
ERWM-VM2-01D90	

Wiring Diagram



Electrical connection (VM1 / VM2)	
L1 - L2 - L3	Supply voltage
N - A - B	Voltage and neutral detection
15 - 16 / 18	Output contact

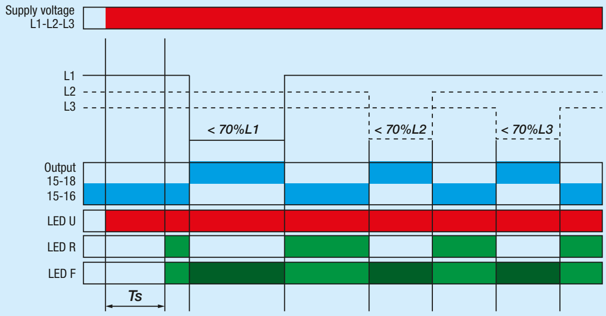
Functions

Multiple Protection Models (ERWM-VM1 / VM2)

Operating mode

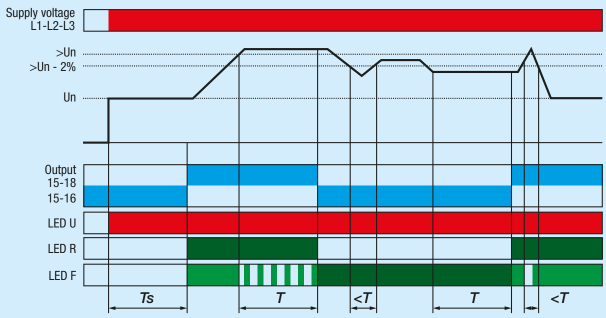
PF (phase loss) – It occurs when the voltage of one of the phases drops below 70% of the supply voltage. The maximum time delay is 350 ms for both the fault detection and the return of the ERWM to normal operation.

Timing diagram



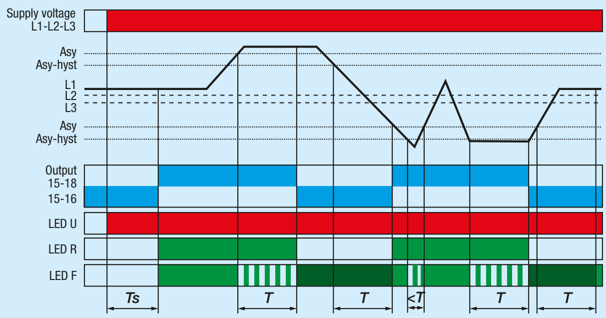
>Un (overvoltage) – It occurs after the rated tripping voltage (Un) (208 to 480 V) and the tripping overvoltage percentage (>Un) (3 to 15%) are selected. The time delay is defined by the time scale (1 to 30 s) or disabled (OFF) acting in a maximum of 350 ms. The selected time delay is for both the fault detection and the return of the ERWM to normal operation.

Timing diagram



Asy (unbalance) – It occurs when the voltage of one, two or three of the phases vary, calculating the average value of the three phases and also the greatest voltage variation value by the average value. The worst voltage variation case is taken into account in the unbalance calculation. The time delay is defined by the time scale (1 to 30 s) or disabled (OFF) acting in a maximum of 350 ms. The selected time delay is for both the fault detection and the return of the ERWM to normal operation.

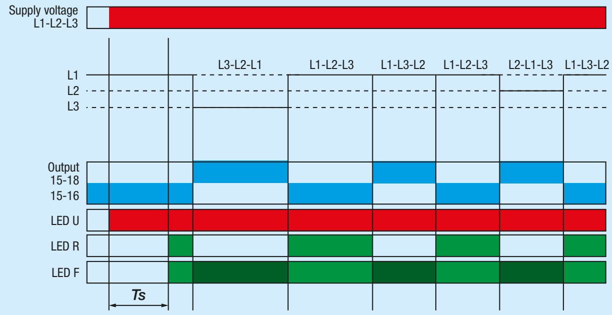
Timing diagram



Operating mode

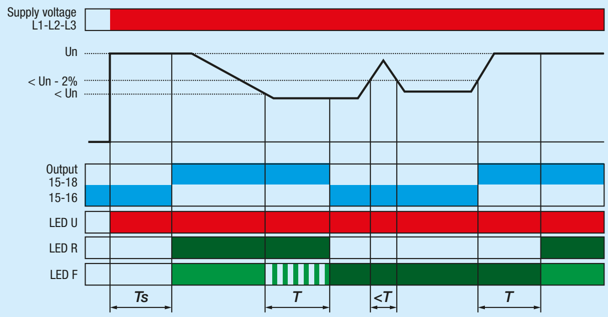
PS (phase sequence[1]) – It occurs when the phases are not connected in the correct sequence (L1-L2-L3) or even when a phase inversion occurs during operation. The maximum time delay is 350 ms for both the fault detection and the return of the EWM to normal operation. Only the ERWM-VM1 measures phase sequence.

Timing diagram



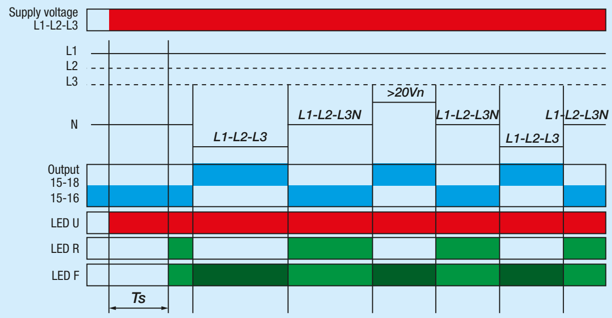
>Un (undervoltage) – It occurs after the rated tripping voltage (Un) (208 to 480 V) and the tripping undervoltage percentage (>Un) (-3 to -15%) are selected. The time delay is defined by the time scale (1 to 30 s) or disabled (OFF) acting in a maximum of 350 ms. The selected time delay is for both the fault detection and the return of the ERWM to normal operation.

Timing diagram



ND (neutral detection) – It occurs when the Neutral is not connected or it is disconnected during operation, or also when the voltage rises above 20 V (due to unbalance in the power grid). The maximum time delay is 350 ms for both the fault detection and the return of the ERWM to normal operation. For neutral detection, it is necessary to provide a bridge between terminals A and B; otherwise, the neutral will not be monitored.

Timing diagram



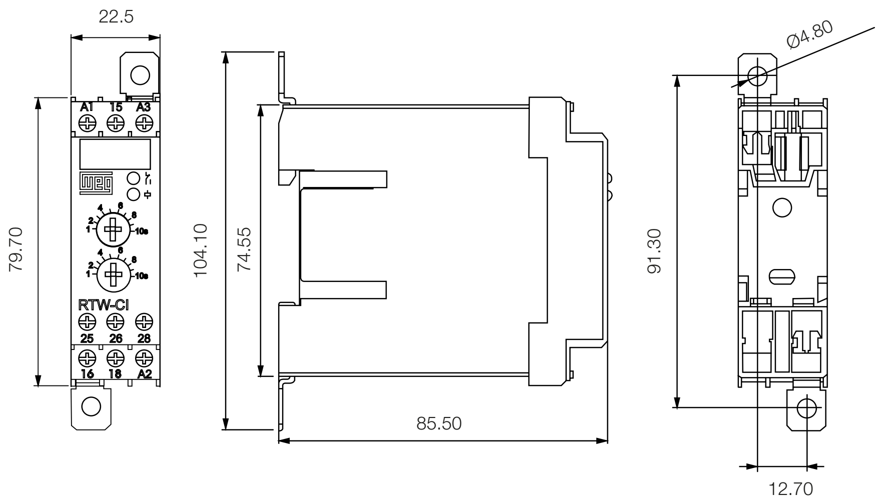
Technical Data

	Product	RPW FF	RPW SF	RPW FSF	RPW SS	RPW PTC	ERWM-VM1	ERWM-VM2
Inputs	Supply voltage (Us) L1 - L2 - L3	220, 380, 440 or 480 V ac (select)				24-240 V ac/V dc	208-480 V ac	
	Frequency	50/60 Hz						
	Sensitivity adjustment	70 to 90%	-	70 to 90%	+/- 3 to 15%	-	+/- 3 to 15%	
	Rated supply voltage tolerance	0.85 to 1.1 x Us for V ac						
	Maximum consumption	80 mA						
	Maximum voltage allowed on neutral	20 V ac	-	20 V ac	-	-	20 V ac	
	Scale accuracy (full scale)	+/- 20%			-	-	+/- 5%	
	Insulation voltage U_i	600 V						
Outputs	Repeatability precision	+/- 1%			-	-	+/- 1%	
	Maximum output contact capacity (I_e)	5 A (resistive load)						
		3 A (AC-15)						
	Fuse (class gL/gG)	4 A						
	Mechanical lifespan	30 x 10^6 switching cycles						
Characteristics	Electrical lifespan	10 x 10^5 switching cycles						
	Ambient temperature allowed	-						
	Operation	-5 a +60 °C						
	Storage	-40 a +85 °C						
	Degree of protection	Enclosure IP20 / Terminals IP20						
	Connection section (min. to max.)	-						
	Cable without end sleeves	1 x (0.5 to 2.5) mm^2						
		2 x (0.5 to 1.5) mm^2						
	Cable with end sleeves	1 x (0.5 to 1.5) mm^2						
		2 x (0.5 to 1.5) mm^2						
	AWG-Rigid Wire	2 x (20 to 14) mm^2						
	Tightening torque	0.8 to 1.2 N.m						
		7 to 10.6 Lb.in						
	Terminal screw	M3						
	Assembly position	Any						
	Shock resistance	15g / 11ms						
	Vibration resistance	10 to 55 Hz / 0.35 mm						
	Weight	0.1 kg						
	Pollution degree	2						
	Overvoltage category	III						
Certifications	European Union	All models						
	Russia	RPW-FSF/SF/SS/PTC					-	-
	Argentina	All models					-	-
	Canada and USA	All models						

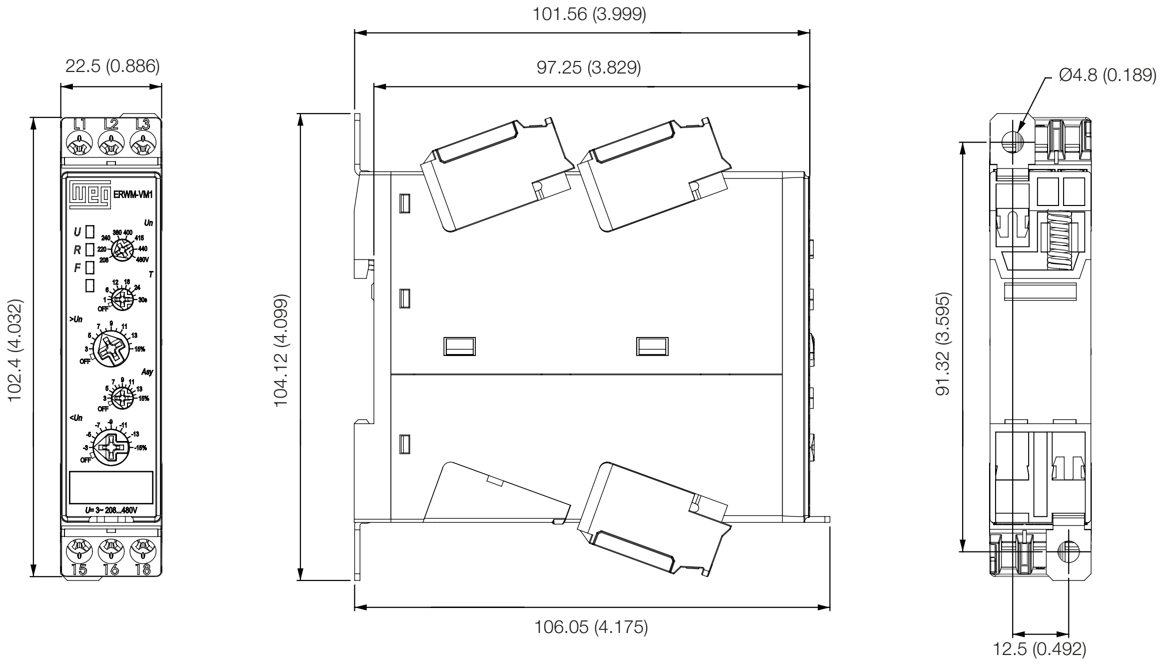
Note: the RPW-SSM-D23 (single-phase) certifications are pending.

Dimensions (mm)

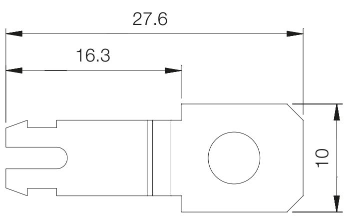
Single Timing or Multiple Timing Models



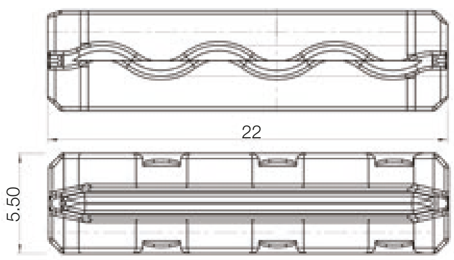
Multifunction Models (VM1 / VM2)



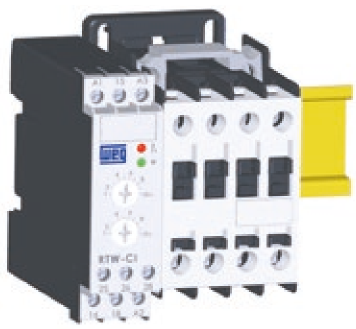
Accessories



PLMP Adapter



MARC adapter for direct mounting on WEG contactors



LEVEL
RELAY

It is an electronic control device that enables monitoring and automatically setting the level of conductive (non-explosive) liquids by means of submerged electrodes. It has a dial that allows adjusting the electronic circuit to the liquid resistance.

Applications

- Protection against dry run of pumps
- Protection against tank overflow
- Activation of solenoids, sound or light alarms
- Process automation in general

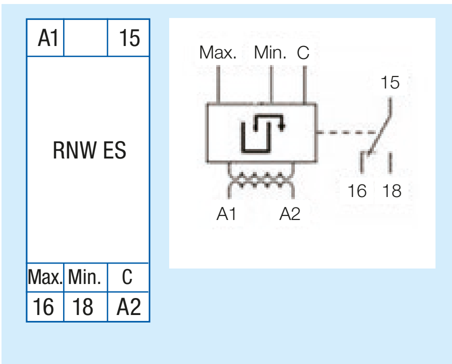
Certifications

Operating Modes

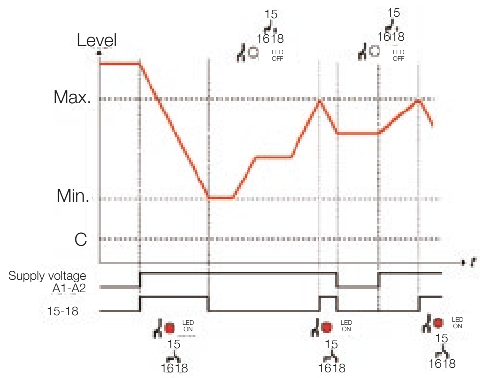
Draining Function

The output relay energizes (contacts 15-18 close) when the liquid reaches the maximum level electrode and de-energizes (contacts 15-18 open) when the minimum level electrode is no longer covered by the liquid.

RNW-ES



Wiring diagram

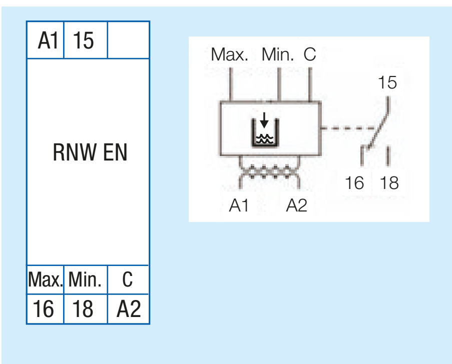


Function diagram

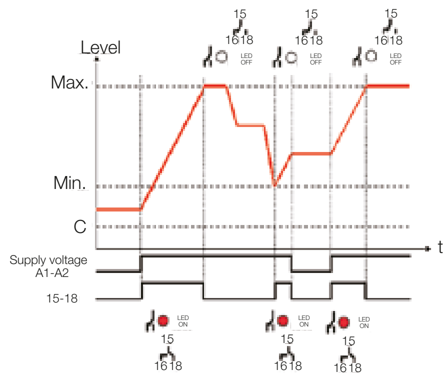
Filling Function

The output relay energizes (contacts 15-18 close) when the minimum level electrode is not covered and de-energizes (contacts 15-18 open) when the liquid reaches the maximum level electrode.

RNW-EN



Wiring diagram



Function diagram

Selection

RNW - EN - E09

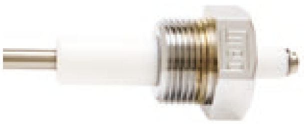
- RNW: WEG level relay
- EN: EN - Filling / ES - Draining Function
- E09: Power supply selection — E09 = 100-240 V ac / V dc

Specification

Reference	Supply voltage	Description
RNW-ES-E09	100-240 V ac or 100-240 V dc (A1-A2)	Level relay, draining function

Reference	Supply voltage	Description
RNW-EN-E09	100-240 V ac or 100-240 V dc (A1-A2)	Level relay, filling function

Accessories



Shaft electrode

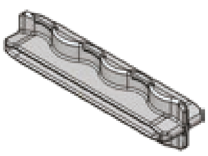
Reference	Description
EHW	Teflon-coated stainless steel shaft, 300 mm long, chrome-plated brass hexagonal screw

Pendulum electrode

Reference	Description
EPW	Body in natural black polypropylene, stainless steel sensor shaft, 1 m cable (flexible 10 mm^2)

PLMP Adapter

Reference	Description
PLMP	Adapter for screw fixing (2 parts per package)



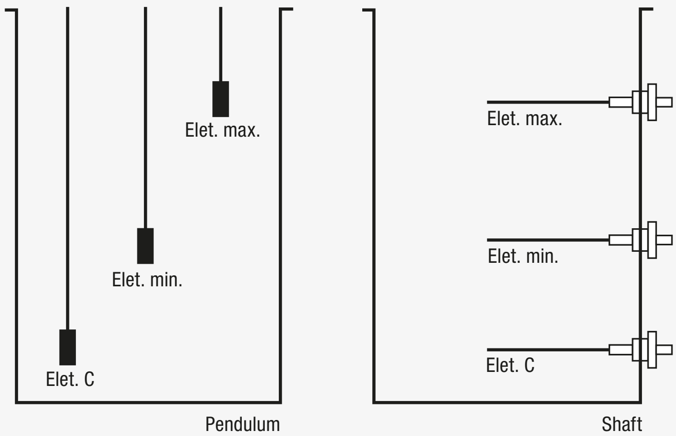
MARC Adapter

Reference	Description
MARC	Adapter for direct mounting on WEG contactors CWM9-105 / CAWM4

Note: the PLMP and MARC adapters can be installed with any WEG electronic relay (RTW, RPW or RNW).

Installation

The electrodes must be installed on the RNW and fixed in the tank according to desired levels, minimum or maximum, and the reference electrode must be positioned in the lower part, below the other electrodes. The electrodes are available in 2 models, shaft (EHW) or pendulum (EPW). When a metallic tank is used, it can replace the reference electrode.



The shaft model (EHW) can be installed in the horizontal and vertical position

Application Example

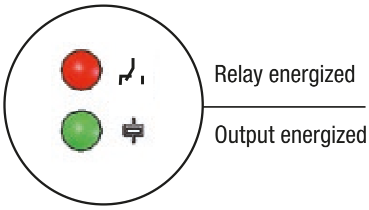
Operation

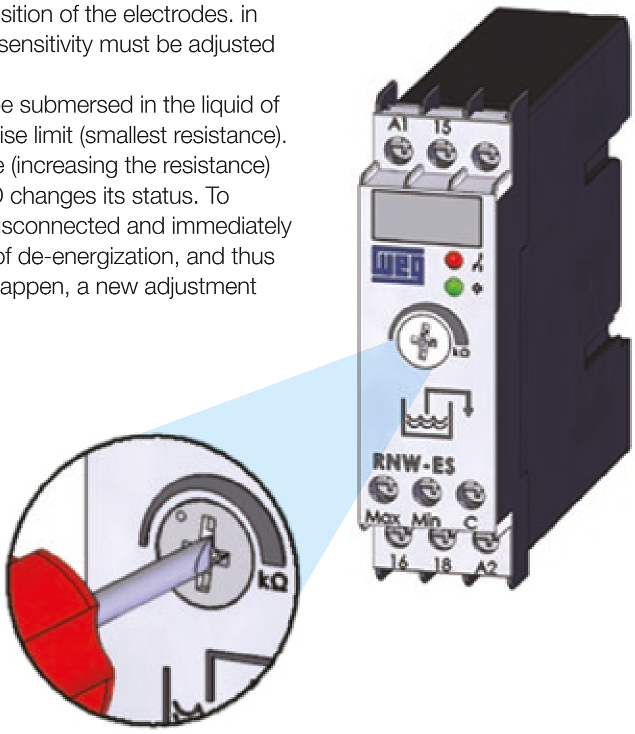
It is based on the measurement of the electric current of the liquid in the tank by means of a set of submerged electrodes, which work as liquid presence/absence sensors.
When the system is energized, an alternating current[1)] is applied to the reference electrode. Once the liquid comes into contact with the electrodes, a path is established for the circulation of electric current between them. An electronic circuit compares the current and, according to the chosen model, executes the logic that switches the output contacts.

Note: 1) The AC current minimizes the electrolysis and increases the lifespan of the electrodes.

Sensitivity Adjustment

The resistance may vary according to the liquid and the position of the electrodes. in order to adapt the RNW electronic circuit to the liquid, the sensitivity must be adjusted through the front dial, which has a graded scale (kΩ).
To perform the sensitivity adjustment, all electrodes must be submersed in the liquid of the tank, and the dial must be positioned at its anti-clockwise limit (smallest resistance). With the relay energized, the dial must be turned clockwise (increasing the resistance) until the relay output switches its contacts and the red LED changes its status. To confirm the adjustment, the reference electrode must be disconnected and immediately reconnected. The RNW must return to its previous status of de-energization, and thus the ideal sensitivity point will be adjusted. If that does not happen, a new adjustment procedure must be performed.





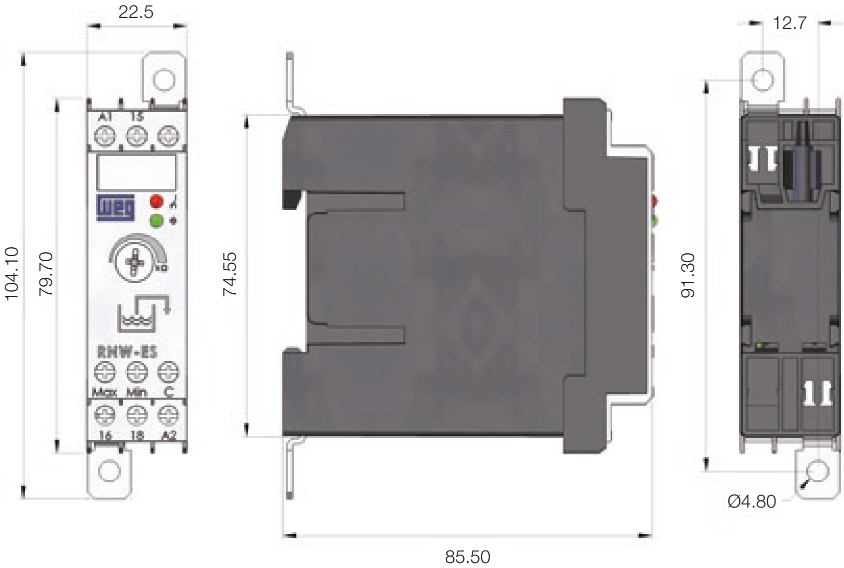
Technical Data

Inputs	Product		RNW ES / RNW EN
	Supply voltage (1h)	A1-A2	100-240 V ac (50/60 Hz) / V dc
	Rated supply voltage tolerance		0.85 to 1.1 x Us
	Isolated rated voltage (U_i)		300 V
	Frequency		50/60 Hz
	Maximum consumption		2 / 1 VA/W
Outputs	Contacts	15 - 16 / 18	1 SPDT
	Capacity of the output contacts (Ie)		AC-12 (resistive) at 250 V ac - 5 A
	AC-15 at 230 V ac		3 A
	DC-13 at 24 V dc		1 A
	DC-13 at 48 V dc		0.45 A
	DC-13 at 60 V dc		0.35 A
	DC-13 at 125 V dc		0.2 A
	DC-13 at 205 V dc		0.1 A
	A300		AC-15
	R300		DC-13
	Rated thermal current (I_{th})		10 A fo AC
			1 A for DC
	Fuse (class gL/gG)		4 A
	Mechanical lifespan		30 x 10^6 switching cycles
Characteristics	Ambient temperature allowed		
	Operation		-5 to +60 °C
	Storage		-40 to +85 °C
	Degree of protection		Enclosure IP20 / Terminals IP20
	Connection section (min. to max.) - Cable without end sleeve		1 x (0.5 to 2.5) mm²
			2 x (0.5 to 1.5) mm²
	Cable with end sleeves		1 x (0.5 to 2.5) mm²
			2 x (0.5 to 1.5) mm²
	AWG-Rigid Wire		2 x (30 to 14) AWG
	Tightening torque		0.8 to 1.2 N.m
			7 to 10.6 lb.in
	Terminal screws		M3
	Assembly position		Any
	Shock resistance		15g / 11ms
	Vibration resistance		10 to 55 Hz / 0.35 mm
	Weight		0.08 kg
	Pollution degree		2
	Overvoltage category		II
	Sensitivity adjustment		0 to 100 kΩ
Sensors	Electrode voltage		7 V ac
	Electrode current		0.05 mA
	Maximum sensor cable length		100 m (maximum cable capacitance 2.2 nF)[1)]
	Sensor operating temperature	Shaft	0 to + 260 °C
		Pendulum	0 to + 60 °C
	Acceptable sensor pressure	Shaft	3 kgf / cm²
		Pendulum	-
	Sensor weight	Shaft	0.230 kg
		Pendulum	0.012 kg
Certifications	European Union		All models
	Canada and USA		
	Argentina		

Notes: 1) Avoid running electrode cables close to power cables.
In order to connect the cables, it is recommended to use single-pole cables.

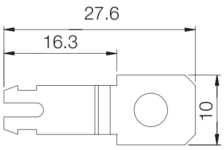
Dimensions (mm)

Model RNW-EN or RNW-ES



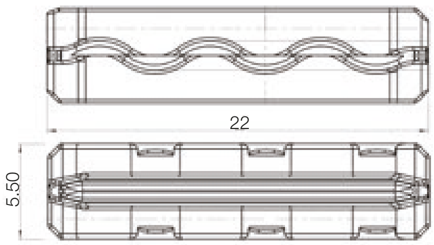
Accessories

Adapter for Screw Fixing

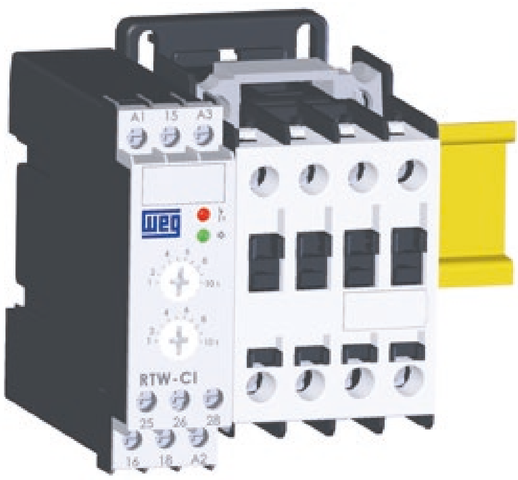


PLMP Adapter

Adapter for Direct Mounting on WEG Contactors



MARC Adapter



Note: the PLMP and MARC accessories can be used in any electronic relay (RTW, RPW or RNW).

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