

Basic Meters

EMS-13/EMS-13a

Features

- High brightness red LED display.
- Programmed values of parameters are protected against unintentional / unauthorised changes.
- Entering program mode is possible by means of short links or buttons.
- Measurement of frequency parameter(Average).



Ordering Information

Models	Function	Source Voltage	Display Parameters
EMS-13		240V AC	(L – N)Frequency
EMS-13a			

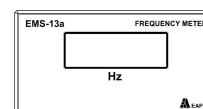
Note:EMS-13 available in 110V AC also.

Front View

EMS-13

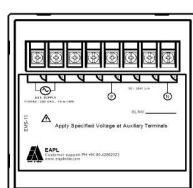


EMS-13a

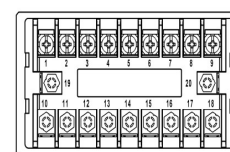


Rear View

EMS-13



EMS-13a



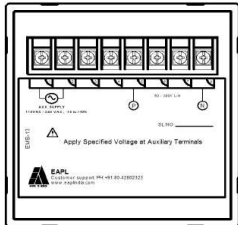
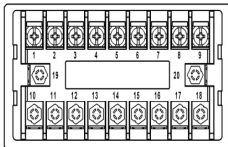
Over-all Dimension

Models	Dimension Details in mm			Cutout Dimension in mm	
	W	H	D	W	H
EMS-13/EMS-13s/EMS-13y	96	96	95.5	92	92
EMS-13a	98	50	79	92	46

■ Specifications

Parameters	Models	EMS-13	EMS-13a
Function		Frequency Meter	
Rated supply Voltage		240V AC(-15% to +10%)	
Rated Frequency		50 Hz \pm 5%	
Power consumption		AC Approx. 5 VA	
Burden		< 0.2 VA per Volts/Amps input	
Input Voltage		Range 50V-300V(L-N)	
Input Frequency		45 Hz to 65 Hz	
Recovery Time		500msec minimum	
Frequency		\pm 1% of FS \pm 1digit	
Ambient Temperature		Operation : -10°C to + 55°C(14°F to 131°F) Storage : -25°C to + 80°C(-13°F to 176°F)	
Humidity		Up to 95% RH @ 40°C	
Dielectric Strength		2.5 KV AC, 50Hz for 1 minute (Between current carrying & non-current carrying parts)	
Insulation resistance		>100M ohms @ 500V DC	
Electrical connection		Screw type terminals with self lifting clamps	
Dimension (W x H x D)		96 X 96 X 95.5 mm	96 X 50X 79 mm
Cut-out Dimension(W x H)		92 x 92mm	92 x 46mm

Connection and Terminal Details

	EMS-13	EMS-13a
Connection Details		
Terminal Details	EMS-13 1,2 : Auxiliary Supply(240 VAC,-15% to +10%) & Auxiliary Supply(110 VAC,-15% to +10%) 5 : R Phase 8 : Neutral	EMS-13a 1,2 : Auxiliary Supply(240 VAC,-15% to +10%) 6 : Phase 9 : Neutral

■ Coils Ratings for High-sensitivity Models

Rated voltage	5VDC	12VDC	24VDC
Rated current	50.0mA	20.8mA	10.42 mA
Coil resistance	100Ω	576Ω	2,304Ω
Must operate voltage	75% max. of the rated voltage		
Must release voltage	10% min. of the rated voltage		
Max. voltage	180% of rated voltage (at 23°C)		
Power consumption	Approx. 250mW		

Note: The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of $\pm 10\%$.

■ Contact Ratings

Item	General-purpose Models		High-capacity Models	High-sensitivity Models
Number of poles	1 pole	2 poles	1 pole	1 pole
Contact material	Ag Alloy (Cd free)			
Load	Resistive load ($\cos\phi=1$)			
Rated load	12A at 250VAC 12A at 24 VDC (See note.)	8A at 250 VAC 8A at 30VDC (See note.)	16A at 250VAC 16A at 30VDC (See note.)	10A at 250VAC 10A at 24VDC (See note.)
Rated carry current	12A (See note.)	8A (70°C)/5A (85°C) (See note.)	16A (See note.)	10A (See note.)
Max. switching voltage	440VAC, 300VDC			
Max. switching current	12A	8A	16A	10A
Max. switching power	3,000VA (4,000VA)	2,000VA	4,000 VA	2,500VA

Note: Contact your OMRON representative for the ratings on fully sealed models.

■ Characteristics

Item	General-purpose (High-capacity) Models	General-purpose Models	High-sensitivity Models
Number of poles	1 pole	2 pole	1 pole
Contact resistance	100mΩ max.		
Operate (set) time	15ms max.		
Release (reset) time	5ms max.		
Max. operating frequency	Mechanical: 18,000 operation/hr Electrical: 1,800 operation/hr at rated load		
Insulation resistance	1,000MΩ min. (at 500VDC)		
Dielectric strength	5,000VAC, 1min between coil and contacts 1,000VAC, 1min between contacts of same polarity	5,000VAC, 1min between coil and contacts 2,500VAC, 1min between contacts of different polarity 1,000VAC, 1min between contacts of same polarity	5,000VAC, 1min between coil and contacts 1,000VAC, 1min between contacts of same polarity
Impulse withstand voltage	10kV (1.2×50μs) between coil and contact		
Vibration resistance	Destruction: 10 to 55 to 10Hz, 0.75mm single amplitude (1.5mm double amplitude) Malfunction: 10 to 55 to 10Hz, 0.75mm single amplitude (1.5mm double amplitude)		
Shock resistance	Destruction: 1,000m/s ² (approx. 100G) Malfunction: 100 m/s ² (approx. 10 G)		
Endurance (Mechanical)	20,000,000 operations (at 18,000 operations/hr)		
Ambient temperature	Operating: -40°C to 85°C (with no icing) Storage: -40°C to 85°C (with no icing)		
Ambient humidity	5% to 85%		
Weight	Approx. 12g		

Note: Values in the above table are the initial values.

■ Approved Standards

UL Recognized (File No. E41643) / CSA Certified (File No. LR31928) -- Ambient Temp. = 40°C

Model	Contact form	Coil ratings	Contact ratings	Number of test operations
G2RL-1A	SPST-NO	3 to 48 VDC	12 A at 250 VAC (General use)	100,000
G2RL-1	SPDT		12 A at 24 VDC (Resistive)	50,000
G2RL-1A-E	SPST-NO	3 to 48 VDC	16 A at 250 VAC (General use)	100,000
G2RL-1-E	SPDT		16 A at 24 VDC (Resistive)	50,000
G2RL-1A-H	SPST-NO	5 to 24 VDC	10 A at 250 VAC (General use) 10 A at 24 VDC (Resistive)	50,000
G2RL-1-H	SPDT			
G2RL-2A	DPST-NO	3 to 48 VDC	8 A at 277 VAC (General use) 8 A at 30 VDC (Resistive)	100,000
G2RL-2	DPDT			

Note: Consult Omron for additional UL/CSA ratings

VDE (EN61810-1) (License No. 119650)

Model	Contact form	Coil ratings	Contact ratings
G2RL-1(A)	1 pole	5, 12, 18, 22, 24, 48 VDC	12 A at 250 VAC ($\cos\phi=1$) 12 A at 24 VDC (L/R=0ms) AC15: 3 A at 240 VAC DC13: 2.5 A at 24 VDC, 50ms
G2RL-1(A)-E	1 pole	5, 12, 18, 22, 24, 48 VDC	16 A at 250 VAC ($\cos\phi=1$) 16 A at 24 VDC (L/R=0 ms) AC15: 3 A at 240 VAC (NO) 1.5 A at 240 VAC (NC) DC13: 2.5 A at 24 VDC (NO), 50ms
G2RL-1(A)-H	1 pole	5, 9, 12, 24 VDC	10 A at 250 VAC ($\cos\phi=1$) 10 A at 24 VDC (L/R=0ms)
G2RL-2(A)	2 poles	5, 12, 18, 22, 24, 48 VDC	8 A at 250 VAC ($\cos\phi=1$) 8 A at 24 VDC (L/R=0 ms) AC15: 1.5 A at 240 VAC DC13: 2 A at 30 VDC, 50ms

Note: To achieve approved life cycles on sealed models, the relay should be vented by removing the “knock off vent nib” on top of relay case after the soldering/washing process.

Electrical Life Data

G2RL-1-E	16 A at 250 VAC ($\cos\phi=1$) 16 A at 24 VDC 8 A at 250 VAC ($\cos\phi=0.4$) 8 A at 30 VDC (L/R=7ms)	30,000 operations min. 30,000 operations min. 200,000 operation min. (normally open side operation) 10,000 operation min. (normally open side operation)
G2RL-1	12 A at 250 VAC ($\cos\phi=1$) 12 A at 24 VDC 5 A at 250 VAC ($\cos\phi=0.4$) 5 A at 30 VDC (L/R=7ms)	50,000 operations min. 30,000 operations min. 150,000 operation min. (normally open side operation) 20,000 operation min. (normally open side operation)
G2RL-1-H	10 A at 250 VAC ($\cos\phi=1$) 10 A at 24 VDC	100,000 operations min. 50,000 operations min.
G2RL-2	8 A at 250 VAC ($\cos\phi=1$) 8 A at 30 VDC	30,000 operations min. 30,000 operations min.

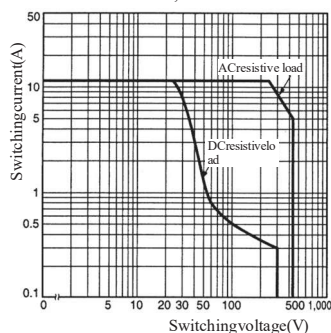
Note: 1. The results shown reflect values measured using very severe test conditions i.e., Duty: 1s ON/1s OFF.

- In order to obtain the full rated life cycles on the fully sealed models, the relay should be properly vented by removing the “knock off vent nib” on top of the relay case after the soldering/washing process.
- Electrical endurance will vary depending on the test conditions. Contact your OMRON representative if you require more detailed information for the electrical endurance under your test conditions.

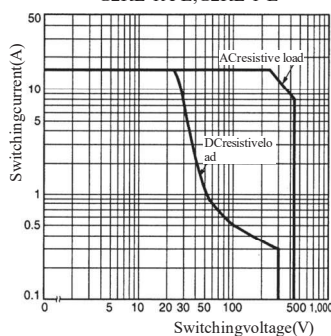
EngineeringData

■ MaximumSwitchingCapacity

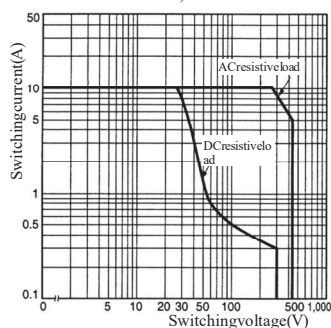
G2RL-1A,G2RL-1



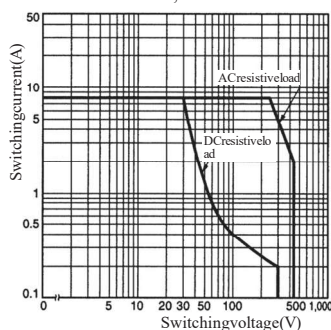
G2RL-1A-E,G2RL-1-E



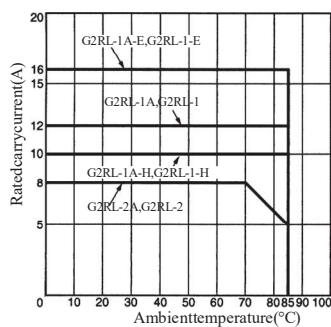
G2RL-1A-H,G2RL-1-H



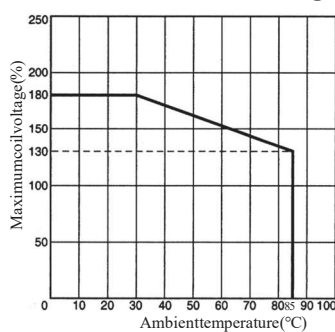
G2RL-2A,G2RL-2



■ AmbientTemperature vs Rated Carry Current



■ AmbientTemperature vs Maximum Coil Voltage



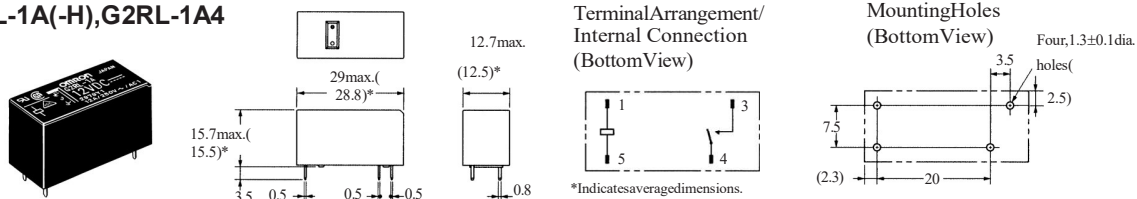
Note: The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

Note: Contact your OMRON representative for the data on fully sealed models.

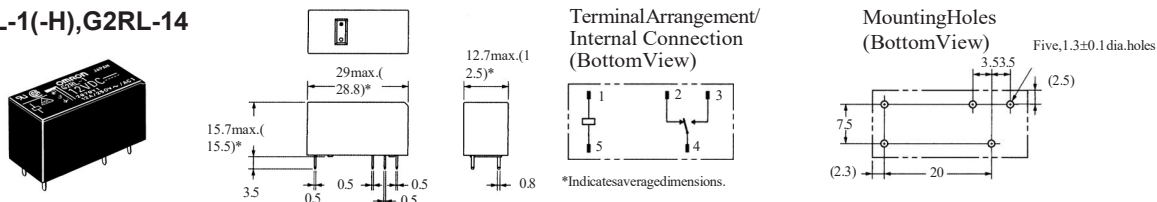
Dimensions

Note: All units are in millimeters unless otherwise indicated.

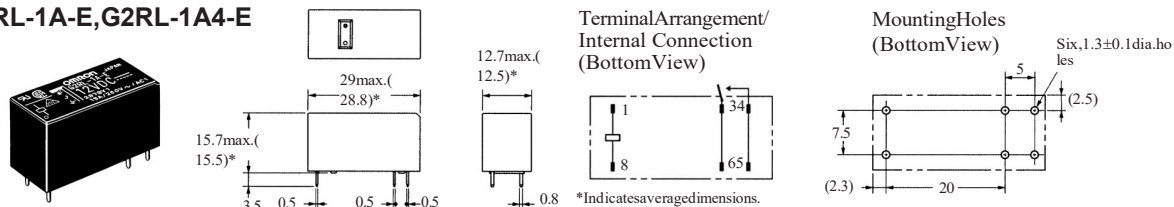
G2RL-1A(-H), G2RL-1A4



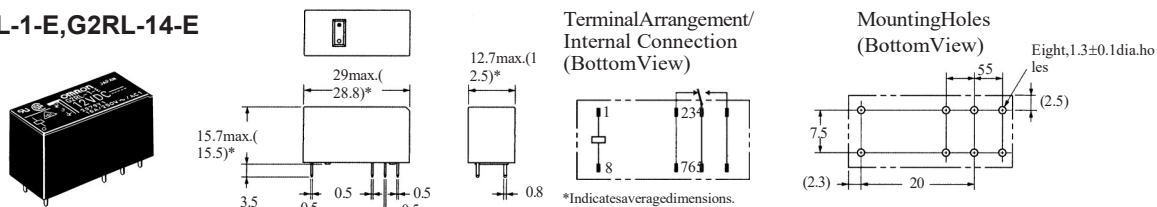
G2RL-1(-H), G2RL-14



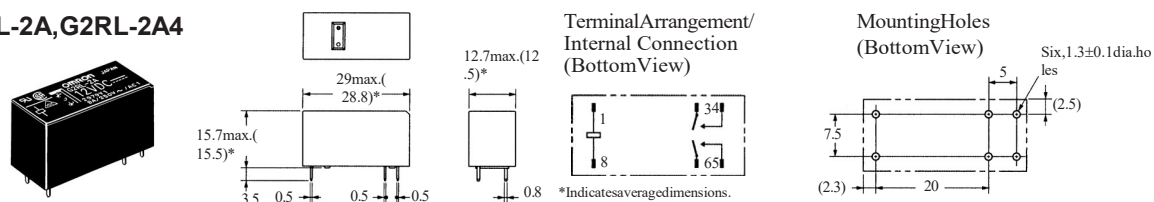
G2RL-1A-E, G2RL-1A4-E



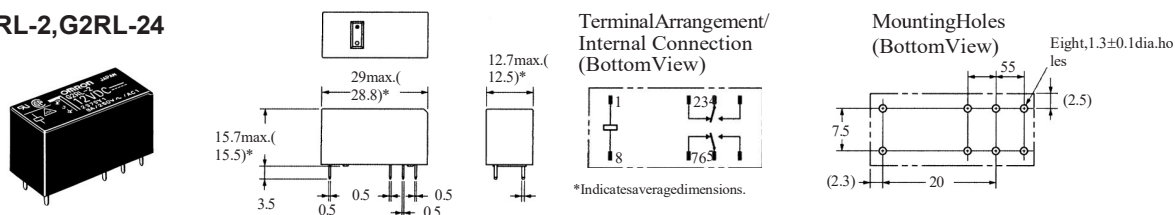
G2RL-1-E, G2RL-14-E



G2RL-2A, G2RL-2A4



G2RL-2, G2RL-24



MEMO

Omron Electronic Components, LLC

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To convert millimeters to inches, multiply by 0.03937. To convert grams to ounces, multiply by 0.03527.

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