

# Dual Source Energy Meter

## EMS-17

### Features

- On site programmable PT (Primary & Secondary) / CT (Primary & Secondary) ratio
- High brightness alpha numeric LED display for parameters and numeric values.
- Password protection for program settings.
- Protection from dust and water as per IP 51.
- Accuracy Class:1.0(as per IEC 62053-21) / 0.5(as per IEC 62053-22).

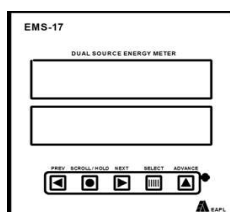


### Ordering Information

Models	Function	Source Voltage	Display Parameters
EMS-17	Dual Source Energy Meter	85V to 270V AC/DC	V(R, Y, B), V(RY, YB, BR), A(R,Y, B), Hz, PF(R, Y, B,T), RPM(for generator mode), Phase angle (R, Y, B),W(R, Y, B,T), KWh(M), MWh(M), LH(M), KWh(G), MWh(G), LH(G) All parameters are available in-Mains(M) and generator mode(G), KVA, KVAh (G&M)

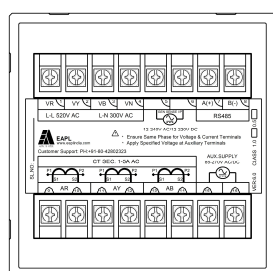
### Front View

### EMS-17



### Rear View

### EMS-17



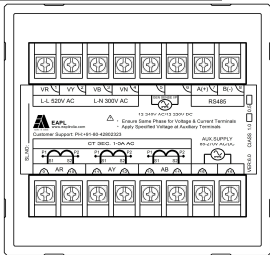
### Over-all Dimension

Models	Dimension Details in mm			Cutout Dimension in mm	
	W	H	D	W	H
EMS-17	96	96	95.5	92	92

## ■ Specifications

Parameters	Models	EMS-17
Function		Dual Source energy meter
Rated supply Voltage		85V to 270 V AC / DC
Rated Frequency		50 / 60Hz $\pm$ 5% for AC only
Power consumption		AC Approx 6VA DC Approx 4W
Burden		< 0.2 VA per Volts/Amps input
Accuracy		Class 1.0/Class 0.5
Input Voltage		3 Phase 4 wire (R,Y,B,N) Range - 415 VAC (-40% to +20%) 110 VAC (-40% to +20%)
Input Current		Current inputs (AR,AY,AB)1A to 5A (to 200%)
Input Frequency		50 Hz, $\pm$ 2%
Communication		RS-485 MODBUS RTU Protocol
Recovery Time		2 sec minimum
Meter Constant		3200 Pulses / KWh
CT Ratio Selectable		Primary 1A to 5000A max. Secondary 1A to 5A
PT Ratio Selectable		Primary 110V to 999KV Secondary 110V to 500V
Device ID		1-247
Baud rate		2400,4800,960019200 bps
Poles		1-28
Protection of configuration settings		User settable Password Range 0001 to 9999
Humidity		Up to 95% RH @ 40°C
Ambient Temperature		Operation: -10°C to +55°C(14°F to 131°F) Storage: -25°C to +80°C(-13°F to 176°F)
Dielectric Strength		2.5KV AC, 50Hz for 1minute (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 95.5mm
Cut-out Dimension(W x H)		92X 92 mm

## Connection and Terminal Details

	EMS-17
Connection Details	
	EMS-17
Terminal Details	<p>1, 2, 3, 4 : R, Y, B, N</p> <p>5, 6 : Generator sensing input (12VAC/DC to 240V AC/220V DC)</p> <p>7, 8 : A, B (RS 485Communication port)</p> <p>9, 10 : S1, S2 (R Phase)</p> <p>11, 12 : S1, S2 (Y Phase)</p> <p>13, 14 : S1, S2 (B Phase)</p> <p>15, 16 : Auxiliary Supply(85-270 V AC/DC)</p>

## ■ 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 <sup>2</sup> (approx. 100G) Malfunction: 100 m/s <sup>2</sup> (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 (EN 61810-1) (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=0 ms) AC15: 3 A at 240 VAC DC13: 2.5 A at 24 VDC, 50 ms
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), 50 ms
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=0 ms)
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, 50 ms

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

## Electrical Life Data

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

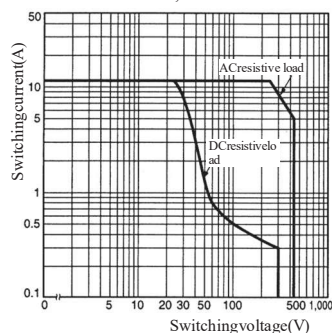
**Note:** 1. The results shown reflect values measured using very severe test conditions i.e., Duty: 1s ON/1s OFF.

- In order to obtain the full rated life cycles on the fully sealed models, the relay should be properly vented by removing the “knockoff 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.

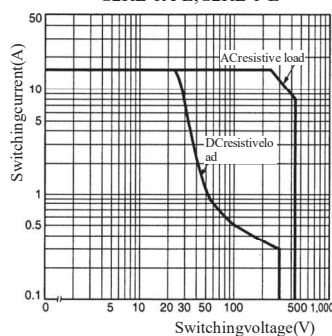
# EngineeringData

## ■ MaximumSwitchingCapacity

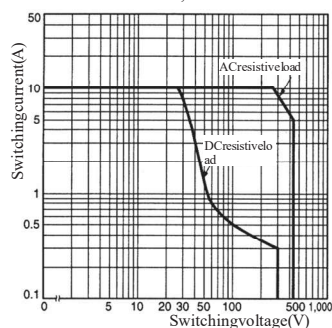
G2RL-1A,G2RL-1



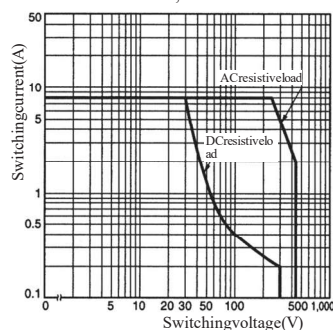
G2RL-1A-E,G2RL-1-E



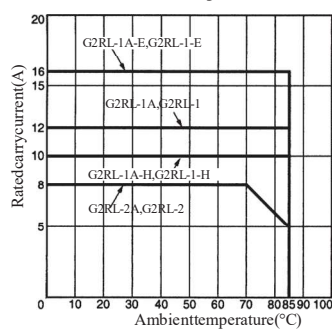
G2RL-1A-H,G2RL-1-H



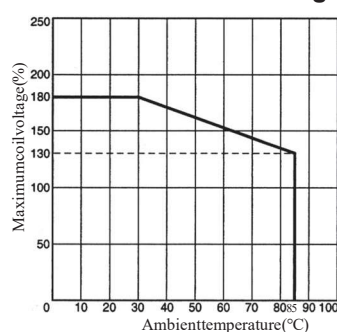
G2RL-2A,G2RL-2



## ■ AmbientTemperature vs Rated Carry Current



## ■ AmbientTemperature vs Maximum Coil Voltage



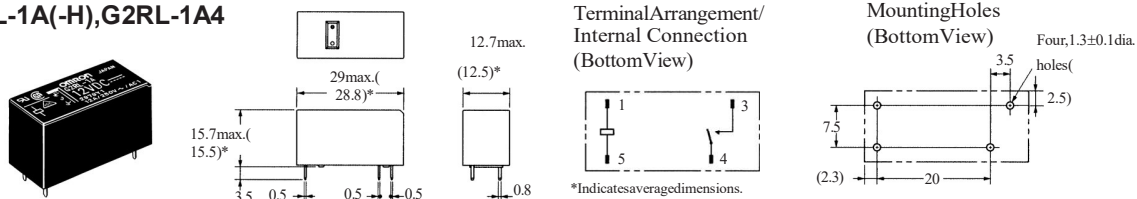
**Note:** The maximum coil voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

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

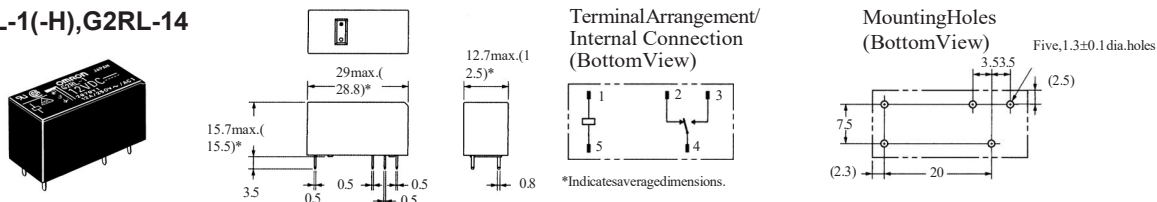
# Dimensions

**Note:** All units are in millimeters unless otherwise indicated.

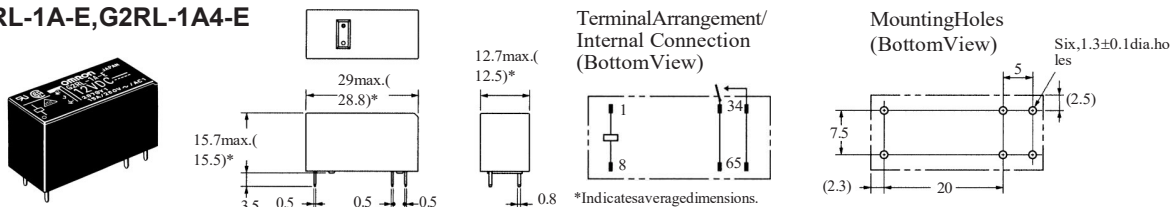
## G2RL-1A(-H), G2RL-1A4



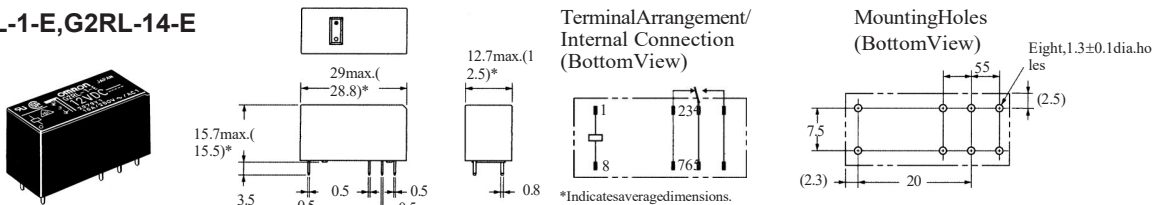
## G2RL-1(-H), G2RL-14



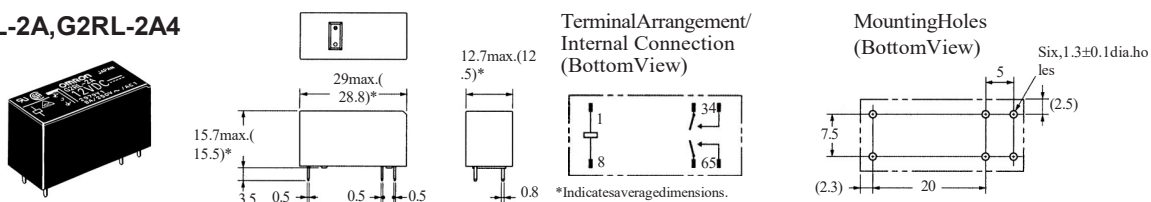
## G2RL-1A-E, G2RL-1A4-E



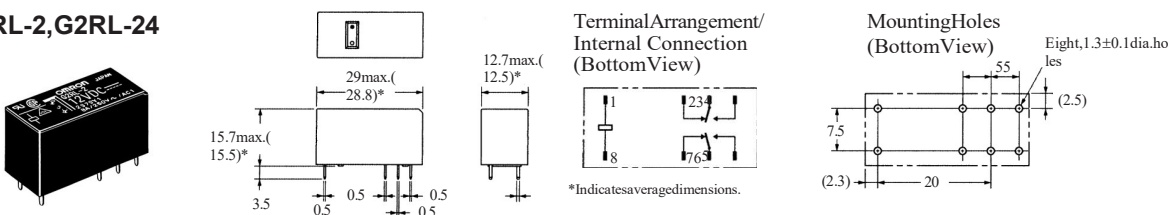
## G2RL-1-E, G2RL-14-E



## G2RL-2A, G2RL-2A4



## G2RL-2, G2RL-24





# MEMO



# Omron Electronic Components, LLC

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  - Terms:** These terms and conditions
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  - Products:** Products and/or services of Seller
  - Including:** Including without limitation
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  - Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installation on subject to separate industry or government regulations.
  - Systems, machines, and equipment that could present a risk to life or property.
- Prohibited Use:** NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
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### ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

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