	EXCEL CELL ELECTRONIC CO., LTD.	NO.	A31109		
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## ETR MIH RELAY

### 1. FEATURES:

- 1-1. Slim type with 16A rated load.
- 1-2. 8 mm insulation distance.
- 1-3. Dielectric strength 5,000V and surge strength up to 10,000V.
- 1-4. UL Class F insulation available.
- 1-5. High sensitivity DC coil type of low power consumption available.
- 1-6. Halogen Free series available.
- 1-7. Comply with RoHS and REACH regulations.
- 1-8. Safety standard & File unnumber: UL&C-UL E141060 / TUV R09854160

### 2. SPECIFICATION:

#### 2-1. Contact Specification:

- 2-1-1. Contact Resistance: Maximum 100mΩ at initial value.  
Test Current: 1A, Open Circuit Test Voltage: 6VDC.  
By using Voltage Drop Method.
- 2-1-2. Contact Capacity: 16 Amps at 240VAC Cosφ=1.  
16 Amps at 24VDC L/R=0.
- 2-1-3. Operate Time: 15 mSec. Max. (D Type)  
20 mSec. Max. (L Type)
- 2-1-4. Release Time: 8 mSec. Max.

#### 2-2. Coil Specification at 20°C:

Coil Sensitivity	Nominal Voltage (VDC)	Nominal Current (mA)	Coil Resistance (Ω±10%)	Power Consumption (W)	Pull-In Voltage (VDC)	Drop-Out Voltage (VDC)	Maximum Allowable Voltage
MIH D/DM/DB	3	240	12.5	Abt. 0.72	80% Maximum	5% Minimum	130%
	5	138.9	36				
	6	120	50				
	9	48.3	115				
	12	60	200				
	24	29.3	820				
	48	14.5	3,300				
MIH L/LM/LB	3	176.5	17	Abt. 0.54	80% Maximum	5% Minimum	130%
	5	106.4	47				
	6	88	68				
	9	58	155				
	12	44.4	270				
	24	21.8	1,100				
	48	10.9	4,400				

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### 3. Electrical Characteristics:

#### 3-1. Life Expectancy:

100,000 operations Minimum at 16A/240VAC Cosφ=1.  
 100,000 operations Minimum at 16A/24VDC L/R=0  
 Rated Voltage is applied.

#### 3-1-2. Mechanical Life:

10,000,000 operations Minimum at No Load condition.  
 Rated Voltage is applied.

#### 3-1-3. Maximum Operating Frequency:

Electrical: 6 operations/minute.  
 Mechanical: 300 operations/minute.

#### 3-2. Dielectric Strength:

##### 3-2-1. Between Contacts:

1,000VAC at Test Frequency 50/60 Hz,  
 Leakage Current: 5mA for 1 minute.

##### 3-2-2. Between Coil & Contact:

5,000VAC at Test Frequency 50/60 Hz,  
 Leakage Current: 5mA for 1 minute.

##### 3-2-3. Surge Strength

10,000V ( between coil & contact 1.2x50μSec)

#### 3-3. Insulation Resistance:

≥ 100 MΩ Minimum.

A Voltage of 500VDC should be applied after which measurement shall be made.

#### 3-4. Vibration

##### 3-4-1. Endurance I:

The Coil shall be maintained under not energized condition, double amplitude 1.5 mm, the entire frequency range changes from 10 to 55 Hz then returns to 10 Hz shall be made in 1 minute. This motion shall be applied for a period of 2 hours in each of 3 mutually perpendicular axis (a total of 6 hours) There should not be any deformations in construction and in appearance, while the Electrical Specifications should be fulfilled after the test.

##### 3-4-2. Endurance II (Error Operation):

The Coil shall be maintained under energized condition, double amplitude 1.5 mm, the entire frequency range changes from 10 to 55 Hz then returns to 10 Hz shall be made in 1 minute. This motion shall be applied for a period of 5 minutes in 3 mutually perpendicular axis. Malfunction is not allowed during the test (contact breaking time should be less than 1 millisecond) In addition, there should not be any deformations in construction and in appearance while the Electrical Specifications should be fulfilled after the test.

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### 3-5. Shock:

#### 3-5-1. Endurance I:

Peak Acceleration: 1000m/s<sup>2</sup>

The Coil shall be maintained under not energized condition, 5 successive shocks shall be applied in 3 mutually perpendicular axis. There should not be any deformations in construction and in appearance while the Electrical Specifications should be fulfilled after the test.

#### 3-5-2. Endurance II

(Error Operation):

Peak Acceleration: 100m/s<sup>2</sup>

The Coil should be maintained under energized condition, 2 successive shocks shall be applied in 3 mutually perpendicular axis. Malfunction is not allowed during the test (contact breaking time should be less than 1 millisecond) In addition, there should not be any deformations in construction and in appearance while the Electrical Specifications should be fulfilled after the test.

## 4. Environmental Characteristics:

### 4-1. Temperature Range:

#### 4-1-1. Operating Temperature Range:

-30 to + 70°C

Operating temperature range is the range of ambient temperature of which the Relay can be operated continuously within operative voltage range of coil (no condensation of water drops under low temperature condition)

#### 4-1-2. Storage Temperature Range:

-40 to + 85°C.

Storage temperature range is the range of ambient temperature of which the Relay can be stored without damages (no condensation of water drops under low temperature condition). Conditions are as specified elsewhere in these specifications.

### 4-2. Humidity Range:

45~85% RH.

### 4-3. Coil Temperature Rise

45°C Max.(D type)

30°C Max.(L type)

### 4-4. Cold Resistance:

#### 4-4-1. Cold Resistance in Use:

Relay should be kept in temperature chamber at -30 ± 2°C for two hours that no current or voltage shall be supplied to Relay. Such condition shall be maintained while the rated voltage is supplied to Relay, then the Relay shall operate normally. (No condensation of water drops under low temperature condition)

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4-4-2. Storage Cold Resistance: Relay should be kept in temperature chamber at  $-40 \pm 2^{\circ}\text{C}$  for 72 hours. Then the Relays shall be maintained at standard atmospheric condition for 1 to 2 hours after which measurement shall be made. Construction, Relay operation, Insulation Resistance and Dielectric Strength shall satisfy the specification requirements. (No condensation of water drops under low temperature condition)

4-5. Heat Resistance:

4-5-1. Heat Resistance in Use: Relay should be kept in temperature chamber at  $70 \pm 2^{\circ}\text{C}$  for two hours that rated Voltage should be supplied to Coil while rated Current should be supplied to Contacts. Such condition shall be maintained while the rated voltage is supplied to Relay, then Relay shall operate normally.

4-5-2. Storage Heat Resistance: Relay should be kept in temperature chamber at  $85 \pm 2^{\circ}\text{C}$  for 16 hours. Then the Relays shall be maintained at standard atmospheric condition for 1 to 2 hours after which measurement shall be made. Construction, Relay operation, Insulation Resistance and Dielectric Strength shall satisfy the specification requirements.

4-6. Moisture Resistance: Relay should be kept in temperature chamber at  $40 \pm 2^{\circ}\text{C}$  (90~95% RH) for 48 hours. Then the Relays shall be maintained at standard atmospheric condition for 1 to 2 hours after which measurement shall be made. Construction, Relay operation, Insulation Resistance, Dielectric Strength shall satisfy the specification requirements.

## 5. Terminal Characteristics:

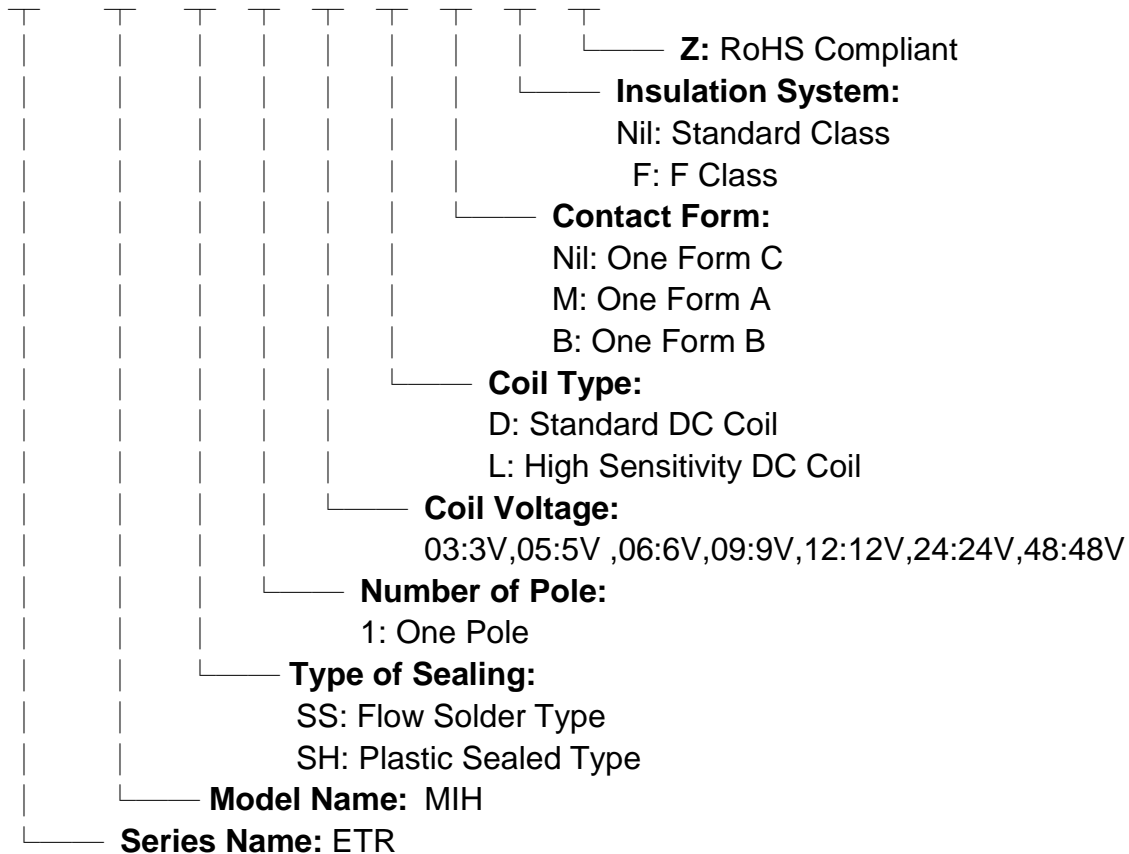
5-1. Soldering Dip Test: The front 3 mm of Terminal should be immersed for  $3 \pm 0.5$  seconds at  $245 \pm 5^{\circ}\text{C}$ . Soldered area must be minimum 90% of the soldering surface.

5-2. Soldering Heat Resistance: When the Terminal are immersed into soldering bath at  $260^{\circ}\text{C}$  for 3 seconds, the Relay shall satisfy all electrical and mechanical specifications and must not have excessive change in outside appearance.

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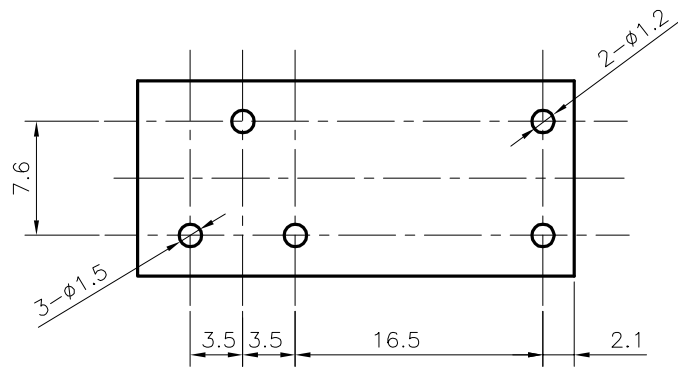
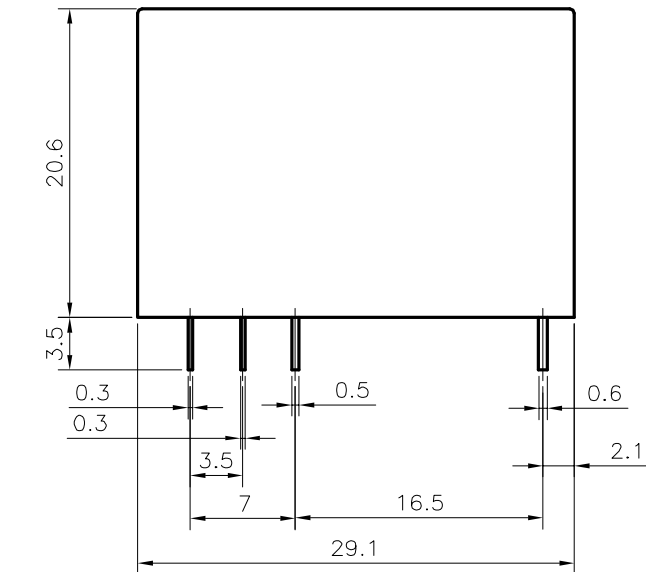
## 6. PART NUMBERING SYSTE

ETR - MIH - SH - 1 24 L F Z

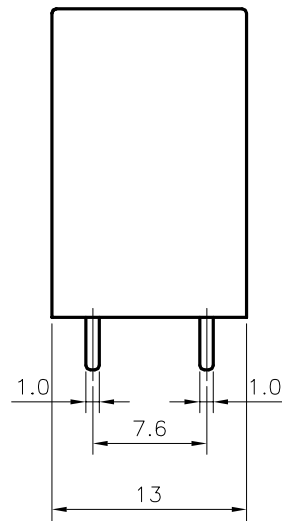


\*Marking without: “ETR” & ”Z” .

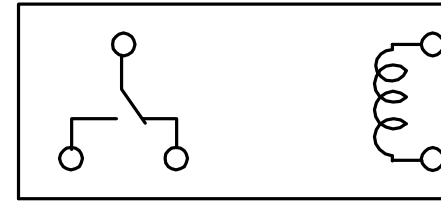
# Dimension



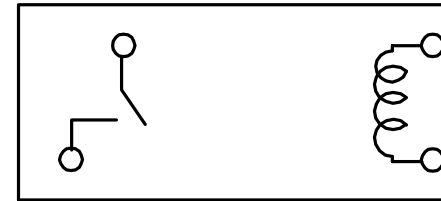
## P.C.B LAYOUT



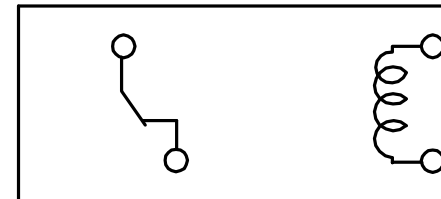
One Form C



One Form A



One Form B



BOTTOM VIEW

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