



### 1 Form A 8A/16A, Small Polarized Power Relays (latching type)

## DW RELAYS (ADW1)

**New**



Low profile type (Inrush type)



Reflow compatible type (Standard type)



IEC60335-1 compliant type (Standard & Inrush type)

**RoHS compliant**

### FEATURES

1. Low profile type available (h = 15.8 mm .622 inch)
2. Inrush type available (TV-8 UL/C-UL approved)
3. IEC60335-1\* compliant type available (PTI 325V VDE approved)
4. Reflow possible (pin-in-paste)
5. Certified by UL/C-UL, VDE

\* Common safety standard for major electrical appliance

### TYPICAL APPLICATIONS

1. Lighting control equipment
2. Smart meters
3. Industrial equipment
4. Security equipment
5. Home appliances
6. Various power supplies

Protective construction: Flux-resistant type

### ORDERING INFORMATION

ADW **1**      W

Contact arrangement  
1: 1 Form A

Operating function  
1: 1 coil latching type  
2: 2 coil latching type

Nominal coil voltage (DC)  
03: 3V, 05: 5V, 06: 6V, 09: 9V, 12: 12V, 24: 24V

Contact capacity  
Nil: Standard type (8A)  
H: Inrush type (16A, Inrush current 100A)

Type classification  
Nil: Reflow compatible type  
L: Low profile type  
T: IEC60335-1 compliant type

- Notes: 1. "L" and "T" type are non-compliant reflow soldering.  
2. Low profile type is available (inrush type only).  
3. The suffix "W" on the part number is only displayed on the inner and outer packaging. It is not displayed on the relay.

## TYPES

### 1. Standard type (8A) (Reflow compatible type)

Contact arrangement	Nominal coil voltage	Part No.	
		1 coil latching type	2 coil latching type
1 Form A	3V DC	ADW1103W	ADW1203W
	5V DC	ADW1105W	ADW1205W
	6V DC	ADW1106W	ADW1206W
	9V DC	ADW1109W	ADW1209W
	12V DC	ADW1112W	ADW1212W
	24V DC	ADW1124W	ADW1224W

Standard packing: Carton: 100 pcs.; Case: 500 pcs.

Note: Carton packing is standard. Tube packing type is also available. Please consult us for details.

### 2. Standard type (8A) (IEC60335-1 compliant type)

Contact arrangement	Nominal coil voltage	Part No.	
		1 coil latching type	2 coil latching type
1 Form A	3V DC	ADW1103TW	ADW1203TW
	5V DC	ADW1105TW	ADW1205TW
	6V DC	ADW1106TW	ADW1206TW
	9V DC	ADW1109TW	ADW1209TW
	12V DC	ADW1112TW	ADW1212TW
	24V DC	ADW1124TW	ADW1224TW

Standard packing: Carton: 100 pcs.; Case: 500 pcs.

Note: Carton packing is standard. Tube packing type is also available. Please consult us for details.

### 3. Inrush type (16A, Inrush current 100A · IEC60335-1 compliant type)\*1, \*2

Contact arrangement	Nominal coil voltage	Part No.	
		1 coil latching type	2 coil latching type
1 Form A	3V DC	ADW1103HTW	ADW1203HTW
	5V DC	ADW1105HTW	ADW1205HTW
	6V DC	ADW1106HTW	ADW1206HTW
	9V DC	ADW1109HTW	ADW1209HTW
	12V DC	ADW1112HTW	ADW1212HTW
	24V DC	ADW1124HTW	ADW1224HTW

Standard packing: 100 pcs.; Case: 500 pcs.

Notes: \*1. Carton packing is standard. Tube packing type is also available. Please contact us for details.

\*2. Please contact us for the reflow compatible type of inrush type (16A, Inrush current 100A · IEC60335-1 compliant type).

### 4. Inrush type (16A, Inrush current 100A · Low profile type)

Contact arrangement	Nominal coil voltage	Part No.	
		1 coil latching type	2 coil latching type
1 Form A	3V DC	ADW1103HLW	ADW1203HLW
	5V DC	ADW1105HLW	ADW1205HLW
	6V DC	ADW1106HLW	ADW1206HLW
	9V DC	ADW1109HLW	ADW1209HLW
	12V DC	ADW1112HLW	ADW1212HLW
	24V DC	ADW1124HLW	ADW1224HLW

Standard packing: 100 pcs.; Case: 500 pcs.

## RATING

### 1. Coil data

#### 1) 1 coil latching type

Nominal coil voltage	Set voltage (at 20°C 68°F)	Reset voltage (at 20°C 68°F)	Nominal operating current [ $\pm 10\%$ ] (at 20°C 68°F)	Coil resistance [ $\pm 10\%$ ] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 20°C 68°F)
3V DC	*80%V or less of nominal voltage (Initial)	*80%V or less of nominal voltage (Initial)	66.7mA	45 $\Omega$	200mW	110%V of nominal voltage
5V DC			40.0mA	125 $\Omega$		
6V DC			33.3mA	180 $\Omega$		
9V DC			22.2mA	405 $\Omega$		
12V DC			16.7mA	720 $\Omega$		
24V DC			8.3mA	2,880 $\Omega$		

#### 2) 2 coil latching type

Nominal coil voltage	Set voltage (at 20°C 68°F)	Reset voltage (at 20°C 68°F)	Nominal operating current [ $\pm 10\%$ ] (at 20°C 68°F)		Coil resistance [ $\pm 10\%$ ] (at 20°C 68°F)		Nominal operating power		Max. applied voltage (at 20°C 68°F)
			Set coil	Reset coil	Set coil	Reset coil	Set coil	Reset coil	
3V DC	*80%V or less of nominal voltage (Initial)	*80%V or less of nominal voltage (Initial)	133.3mA	133.3mA	22.5 $\Omega$	22.5 $\Omega$	400mW	400mW	110%V of nominal voltage
5V DC			80.0mA	80.0mA	62.5 $\Omega$	62.5 $\Omega$			
6V DC			66.7mA	66.7mA	90 $\Omega$	90 $\Omega$			
9V DC			44.4mA	44.4mA	202.5 $\Omega$	202.5 $\Omega$			
12V DC			33.3mA	33.3mA	360 $\Omega$	360 $\Omega$			
24V DC			16.7mA	16.7mA	1,440 $\Omega$	1,440 $\Omega$			

\*Square, pulse drive

## 2. Specifications

Characteristics	Item	Specifications		
		Standard type	Inrush type	
Contact	Arrangement	1 Form A		
	Contact resistance (Initial)	Max. 100 m $\Omega$ (By voltage drop 6 V DC 1A)		
	Contact material	AgSnO <sub>2</sub> type		
Rating	Nominal switching capacity (resistive load)	8A 250V AC	16A 277V AC	
	Max. switching power (resistive load)	2,000VA	4,432VA	
	Max. switching voltage	250V AC	277V AC	
	Max. switching current	8A AC	16A AC	
	Nominal operating power	200mW (1 coil latching type), 400mW (2 coil latching type)		
Electrical characteristics	Min. switching capacity (Reference value)*1	100mA 5 V DC		
	Insulation resistance (Initial)	Min. 1,000M $\Omega$ (at 500V DC, Measurement at same location as "Breakdown voltage" section)		
	Breakdown voltage (Initial)	Between open contacts	1,000 Vrms for 1min. (Detection current: 10mA)	
		Between contact and coil	5,000 Vrms for 1min. (Detection current: 10mA)	
	Surge breakdown voltage*2 (Between contact and coil)	12,000 V (Initial)		
	Set time (at 20°C 68°F) (Initial)	Max. 15 ms (Nominal voltage applied to the coil, excluding contact bounce time)		
Reset time (at 20°C 68°F) (Initial)	Max. 15 ms (Nominal voltage applied to the coil, excluding contact bounce time)			
Mechanical characteristics	Shock resistance	Functional	100 m/s <sup>2</sup> (Half-wave pulse of sine wave: 11 ms; detection time: 10 $\mu$ s)	
		Destructive	1,000 m/s <sup>2</sup> (Half-wave pulse of sine wave: 6 ms)	
	Vibration resistance	Functional	10 to 55 Hz at double amplitude of 2 mm (Detection time: 10 $\mu$ s)	
		Destructive	10 to 55 Hz at double amplitude of 3 mm	
Expected life	Mechanical	Min. 10 <sup>6</sup> (at 180 times/min.)		
	Electrical	Resistive load	Min. 5 $\times$ 10 <sup>4</sup> (at 8A 250V AC, at 20 times/min.) Min. 10 <sup>5</sup> (at 5A 250V AC, at 20 times/min.) (IEC60335-1 type only)	
		Inrush current	—	Min. 2.5 $\times$ 10 <sup>4</sup> [Inrush 100A 600W (120V AC) Tungsten] Cycle rate ON:OFF = 1s:59s
Conditions	Conditions for operation, transport and storage*3 *4	Temperature: -40°C to +85°C -40°F to +185°F Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)	Temperature: -40°C to +85°C -40°F to +185°F (8A or less), -40°C to +70°C -40°F to +158°F (Over 8A to 16A) Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)	
Unit weight		Approx. 8 g .28 oz (Low profile type: Approx. 7.5 g .26 oz)		

Notes: \*1. Minimum switching load is a guide to the lower current limit of switching under the micro-load. This parameter is changed by the condition, such as switching times, environment condition, and expected reliability. Therefore, Panasonic Corporation cannot assure the reliability. When the relay is used lower than minimum switching load, reliability is attrition. Please use the relay over minimum switching load.

\*2. Wave is standard shock voltage of  $\pm 1.2 \times 50\mu$ s according to JEC-212-1981

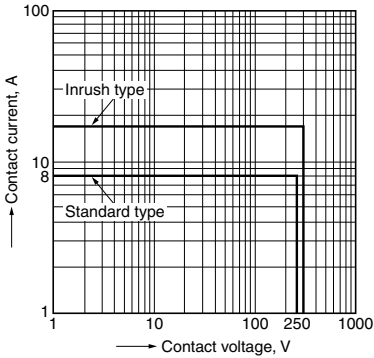
\*3. The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to Usage, transport and storage conditions in NOTES.

\*4. Allowable range when in original packaging is -40°C to +70°C -40°F to +158°F.

**REFERENCE DATA**

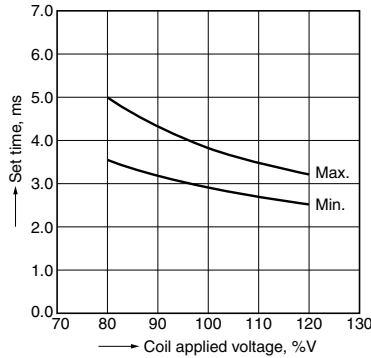
■ Standard type and Inrush type

1. Max. switching capacity (AC resistive load)



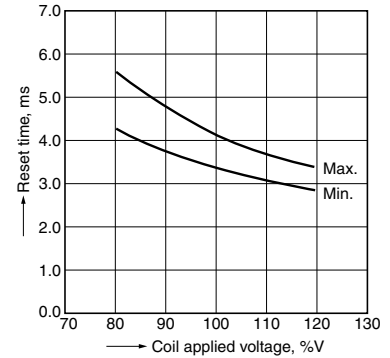
■ Standard type

1. Set time (1 coil latching type)  
 Tested sample: ADW1106, 15 pcs  
 Ambient temperature: 28°C 82.4°F  
 Contact load: 5V DC, 10mA



2. Reset time (1 coil latching type)

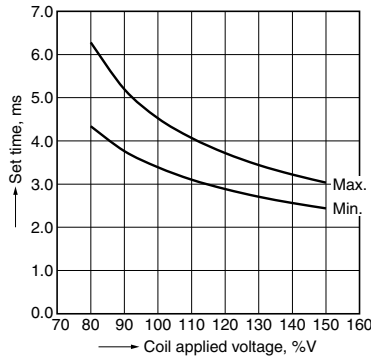
- Tested sample: ADW1106, 15 pcs  
 Ambient temperature: 28°C 82.4°F  
 Contact load: 5V DC, 10mA



■ Inrush type

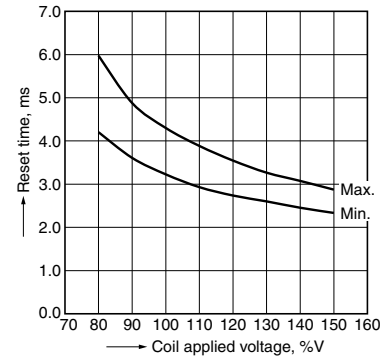
1. Set time (1 coil latching type)

- Tested sample: ADW1112HL, 30 pcs  
 Ambient temperature: 28°C 82.4°F  
 Contact load: 5V DC, 10mA



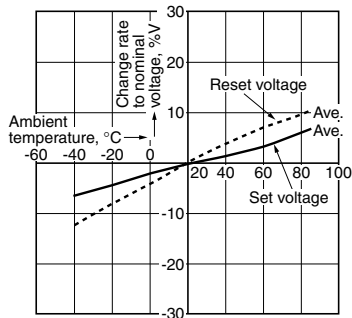
2. Reset time (1 coil latching type)

- Tested sample: ADW1112HL, 30 pcs  
 Ambient temperature: 28°C 82.4°F  
 Contact load: 5V DC, 10mA



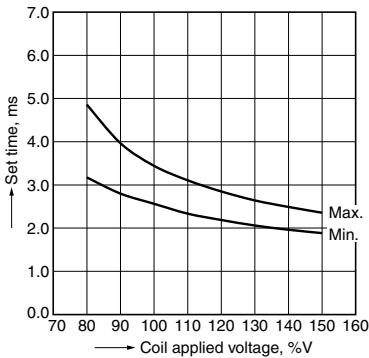
3. Ambient temperature characteristics

- Tested sample: ADW1106, 6pcs  
 Ambient temperature: -40°C to +85°C  
 -40°F to +185°F



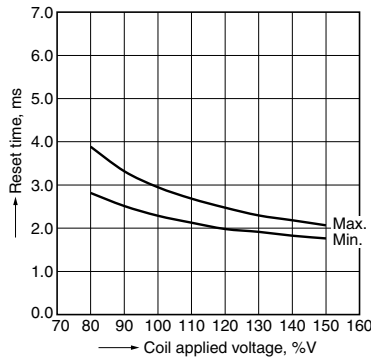
3. Set time (2 coil latching type)

- Tested sample: ADW1212HL, 30 pcs  
 Ambient temperature: 28°C 82.4°F  
 Contact load: 5V DC, 10mA



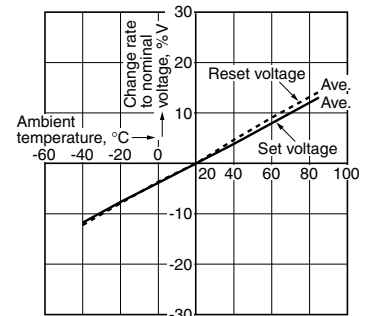
4. Reset time (2 coil latching type)

- Tested sample: ADW1212HL, 30 pcs  
 Ambient temperature: 28°C 82.4°F  
 Contact load: 5V DC, 10mA



5. Ambient temperature characteristics

- Tested sample: ADW1105HL, 6pcs  
 Ambient temperature: -40°C to +85°C  
 -40°F to +185°F



# DIMENSIONS (mm inch)

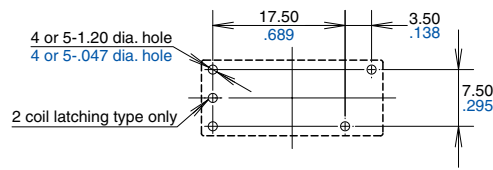
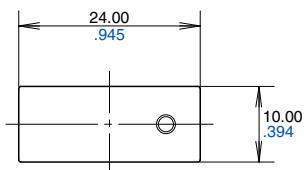
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/ac/e/>

## 1. Standard height type

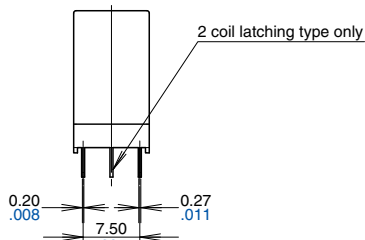
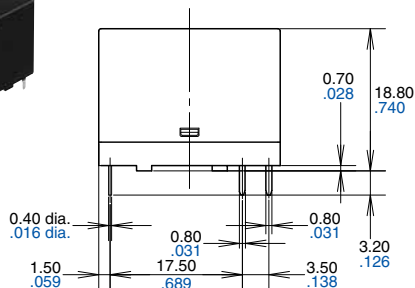
**CAD Data**

External dimensions

PC board pattern (Bottom view)

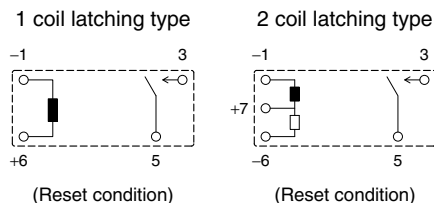


Tolerance:  $\pm 0.1 \pm 0.004$



General tolerance:  $\pm 0.3 \pm 0.012$

Schematic (Bottom view)

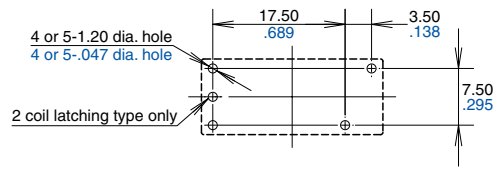
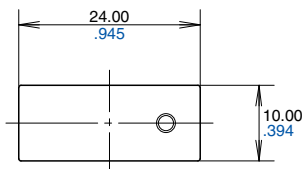


## 2. Low profile type

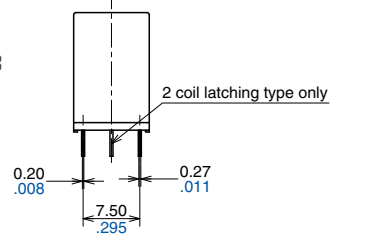
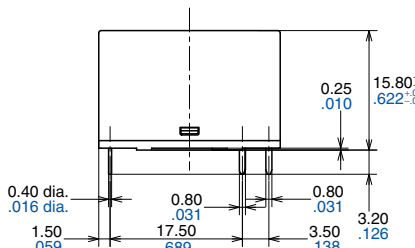
**CAD Data**

External dimensions

PC board pattern (Bottom view)

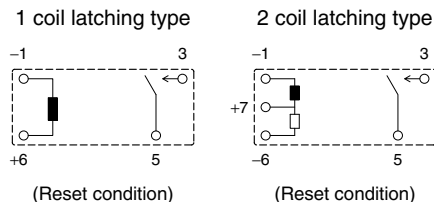


Tolerance:  $\pm 0.1 \pm 0.004$



General tolerance:  $\pm 0.3 \pm 0.012$

Schematic (Bottom view)



## SAFETY STANDARDS

Item	UL/C-UL (Recognized)		VDE (Recognized)		TV rating (UL/C-UL)	
	File No.	Contact rating	File No.	Contact rating	File No.	Contact rating
Standard type (8A)	E43149	8A 250V AC R 85°C 185°F 5×10 <sup>4</sup> 5A 30V DC R 85°C 185°F 5×10 <sup>4</sup>	40032254	8A 250V AC (cosφ=1.0) 85°C 185°F 5×10 <sup>4</sup> 5A 30V DC (0ms) 85°C 185°F 5×10 <sup>4</sup>	—	—
Inrush type (16A)	E43149	16A 277V AC R 60°C 140°F 5×10 <sup>4</sup> 8A 250V AC R 85°C 185°F 5×10 <sup>4</sup> 5A 30V DC R 85°C 185°F 5×10 <sup>4</sup> 1200W Standard ballast 277V AC 50°C 122°F 6×10 <sup>3</sup> 1200W Tungsten, 240V AC 50°C 122°F 6×10 <sup>3</sup> 600W Tungsten, 120V AC 50°C 122°F 2.5×10 <sup>4</sup>  5A 347V AC R 85°C 185°F (UL standards only) 5×10 <sup>4</sup>	40032254	16A 277V AC (cosφ=1.0) 70°C 158°F 5×10 <sup>4</sup> 8A 250V AC (cosφ=1.0) 85°C 185°F 5×10 <sup>4</sup> 5A 30V DC (0ms) 85°C 185°F 5×10 <sup>4</sup>	E43149	TV-8 rating 240V AC 40°C 104°F 2.5×10 <sup>4</sup>

Notes: 1. CSA standards: Certified by C-UL  
2. CQC standard: Application pending. Please contact us.

## NOTES

1. For cautions for use, please read "GENERAL APPLICATION GUIDELINES".

### 2. Solder and cleaning conditions

#### 1) Flow solder mounting conditions

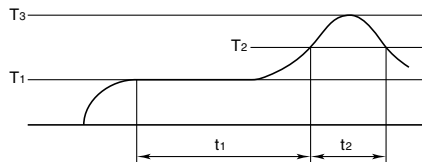
Please obey the following conditions when soldering automatically.

(1) Preheating: within 120°C 248°F (solder surface terminal portion) and within 120 seconds

(2) Soldering iron: 260°C±5°C 500°F±41°F (solder temperature) and within 6 seconds (soldering time)

\*Furthermore, because the type of PC board used and other factors may influence the relays, test that the relays function properly on the actual PC board on which they are mounted.

#### 2) Reflow solder mounting (Pin-in-Paste mounting) conditions



T<sub>1</sub> = 150 to 180°C 302 to 356°F  
 T<sub>2</sub> = 230°C 446°F or more  
 T<sub>3</sub> = 250°C 482°F or less  
 t<sub>1</sub> = 60 to 120 seconds  
 t<sub>2</sub> = within 30 seconds

- Cautions to observe when mounting temperature increases in the relay are greatly dependent on the way different parts are located a PC board and the heating method of the reflow device. Therefore, please conduct testing on the actual device beforehand after making sure the parts soldered on the relay terminals and the top of the relay case are within the temperature conditions given above.

3) Since this is not a sealed type relay, do not clean it as is. Also, be careful not to allow flux to overflow above the PC board or enter the inside of the relay.

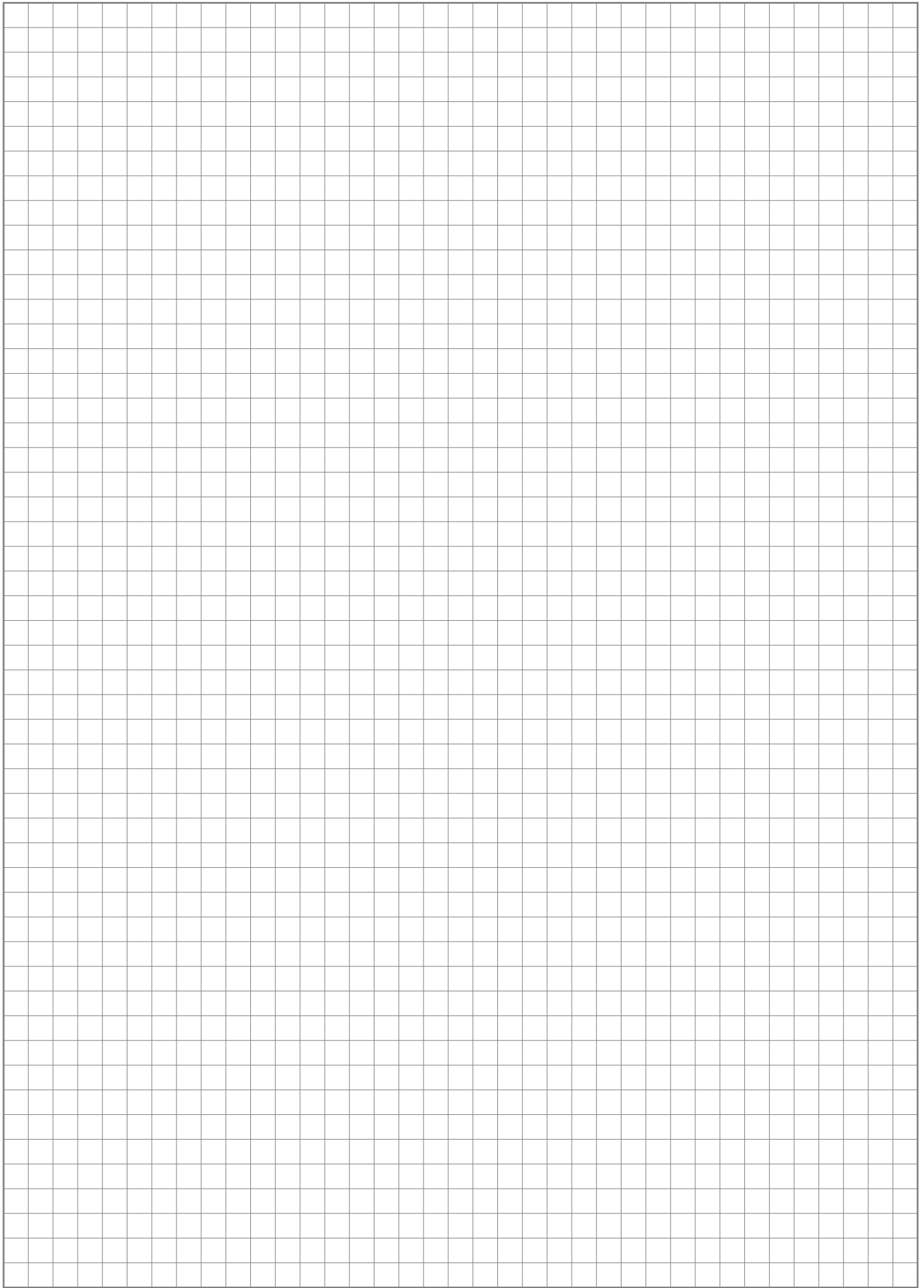
### 3. Max. applied voltage

It is not allowed to apply the continuous maximum voltage to the coil.

In order to obtain the specified performance, please apply nominal coil voltage.

### 4. Set/reset pulse time of latching type relay

Regarding the set/reset pulse time of the latching type relay, it is recommended to apply nominal coil voltage for minimum 30ms pulse across the coil to secure the sure operation considering the ambient temperature and condition change through service life.



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Please contact .....

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