New Product

OMRON

# Single-phase Current Relay
## K8DT-AS

## Detect errors in motors and other equipment through current changes.
## Use in either overcurrent or undercurrent mode.

- Monitor AC or DC currents with one Relay.
- Use with commercially available CTs (CT secondary side: 0 to 1 A or 0 to 5 A).
- Settings for the operating value, hysteresis, startup lock time, and operating time.
- Width of 17.5 mm to reduce space required in panels.
- Push-In Plus Terminal that reduce wiring work.
  The use of cage clamps enables wiring with bare stranded wires.
  Double-insertion holes for crossover wiring (all terminals).
- UL listed for easy shipping to North America.
- Models added with transistor outputs for superior contact reliability.

⚠ Refer to *Safety Precautions* on page 10.
Refer to page 9 for commonly asked questions.

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

## Ordering Information

### Single-phase Current Relay

| Setting range | Power supply voltage | Output | Model |
|---|---|---|---|
| 2 to 20 mA AC/DC, 10 to 100 mA AC/DC, 50 to 500 mA AC/DC | 24 VAC/DC | Relay: SPDT contact output | **K8DT-AS1CD** |
| | | Transistor | **K8DT-AS1TD** |
| | 100 to 240 VAC | Relay: SPDT contact output | **K8DT-AS1CA** |
| | | Transistor | **K8DT-AS1TA** |
| 0.1 to 1 A AC/DC, 0.5 to 5 A AC/DC | 24 VAC/DC | Relay: SPDT contact output | **K8DT-AS2CD** |
| | | Transistor | **K8DT-AS2TD** |
| | 100 to 240 VAC | Relay: SPDT contact output | **K8DT-AS2CA** |
| | | Transistor | **K8DT-AS2TA** |
| 10 to 100 A AC ✻, 20 to 200 A AC ✻ | 24 VAC/DC | Relay: SPDT contact output | **K8DT-AS3CD** |
| | | Transistor | **K8DT-AS3TD** |
| | 100 to 240 VAC | Relay: SPDT contact output | **K8DT-AS3CA** |
| | | Transistor | **K8DT-AS3TA** |

✻ The K8DT-AS3□□ is designed to be used in combination with an OMRON K8AC-CT200L Current Transformer (CT). (Direct input is not possible.)

### OMRON CT

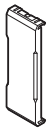
| Appearance | Input range | Applicable Relay | Model |
|---|---|---|---|
|  | 10 to 100 A AC, 20 to 200 A AC | K8DT-AS3 | **K8AC-CT200L** |

### Commercially Available CTs ✻

| Appearance | CT current on secondary side | Applicable Relay |
|---|---|---|
|  | 0 to 1 A AC, 0 to 5 A AC | K8DT-AS2 |

✻ If you use a commercially available CT, do not exceed the overload capacity of the K8DT-AS2.

### Options (Order Separately)
#### Front Cover

| Appearance | Model |
|---|---|
|  | **Y92A-D1A** |

# K8DT-AS

# Ratings and Specifications

## Input Range

| Model | Range ✻1 | Connection terminal | Setting range | Input impedance | Input type | Overload capacity |
|---|---|---|---|---|---|---|
| K8DT-AS1□□ | 20 mA AC/DC | I1-COM | 2 to 20 mA AC/DC | Approx. 5 Ω | Direct input | Continuous input at 120% of maximum input. 1 s at 150% |
| | 100 mA AC/DC | I2-COM | 10 to 100 mA AC/DC | Approx. 1 Ω | Direct input | |
| | 500 mA AC/DC | I3-COM | 50 to 500 mA AC/DC | Approx. 0.2 Ω | Direct input | |
| K8DT-AS2□□ | 1 A AC/DC | I1-COM | 0.1 to 1 A AC/DC | Approx. 0.12 Ω (Load: 0.5 VA) | Direct input or commercially available CT | |
| | 5 A AC/DC | I2-COM | 0.5 to 5 A AC/DC | Approx. 0.02 Ω (Load: 1.5 VA) | | |
| K8DT-AS3□□ | 100 A AC | I2-COM | 10 to 100 A AC ✻2 | --- | OMRON CT | Continuous input at 120% with an OMRON CT (K8AC-CT200L). 30 s at 200% 1 s at 600% ✻ CT capacity on primary side. |
| | 200 A AC | I3-COM | 20 to 200 A AC ✻2 | --- | OMRON CT | |

**✻1.** The range is selected using connected terminals.
**✻2.** The K8DT-AS3 is designed to be used in combination with an OMRON K8AC-CT200L Current Transformer (CT). (Direct input is not possible.)

## Ratings

| | |
|---|---|
| **Power supply voltage** | K8DT-AS□□D: 24 VAC 50/60 Hz, 24 VDC<br>K8DT-AS□□A: 100 to 240 VAC 50/60 Hz |
| **Power consumption** | 24 VAC/DC: 1.8 VA/1 W max.<br>100 to 240 VAC: 2.5 VA max. |
| **Rated insulation voltage** | 600 VAC |
| **Operating value setting range (SV)** | 10% to 100% of the maximum value of the setting range<br>K8DT-AS1: 2 to 20 mA AC/DC<br>10 to 100 mA AC/DC<br>50 to 500 mA AC/DC<br>K8DT-AS2: 0.1 to 1 A AC/DC (Compatible with commercially available CTs.)<br>0.5 to 5 A AC/DC (Compatible with commercially available CTs.)<br>K8DT-AS3: When used with the OMRON CT (K8AC-CT200L).<br>10 to 100 A AC<br>20 to 200 A AC |
| **Operating value** | 100% operation at set value |
| **Reset value setting range (HYS)** | 5% to 50% of operating value |
| **Reset method** | Manual reset/automatic reset (switchable)<br>**Note:** Manual reset: Turn OFF power supply for 1 s or longer. |
| **Operating time setting range (T)** | 0.1 to 30 s |
| **Startup lock time setting range (LOCK)** | 0 to 30 s<br>(The startup lock timer starts when the input has reached approximately 30% or more of the set value.)<br>**Note:** Enabled only for overcurrent operation. |
| **LED Indicators** | Power (PWR): Green, Output (OUT): Yellow, Alarm outputs (ALM): Red |
| **Input impedance** | Refer to *Input Range* on page 2. |
| **Output form** | Relay Output: SPDT contact<br>Transistor Output: 1<br>Switchable between normally open and normally closed with a DIP switch setting. |
| **Output relay ratings** | Rated load: 250 VAC 5 A or 30 VDC 5 A (resistive load),<br>250 VAC 1 A (inductive load),<br>48 VDC 0.2 A (inductive load)<br>Minimum load: 5 VDC, 10 mA (reference values)<br>Mechanical life: 10 million operations min.<br>Electrical life: 5 A at 250 VAC or 30 VDC: 50,000 operations<br>3 A at 250 VAC or 30 VDC:100,000 operations |
| **Transistor output ratings** | Rated voltage: 24 VDC (maximum voltage: 26.4 VDC)<br>Maximum current: 50 mA DC |
| **Ambient operating temperature** | −20 to 60°C (with no condensation or icing) |
| **Storage temperature** | −25 to 65°C (with no condensation or icing) |
| **Ambient operating humidity** | 25% to 85% RH (with no condensation) |
| **Storage humidity** | 25% to 85% RH (with no condensation) |
| **Altitude** | 2,000 m max. |
| **Applicable wires** | Stranded wires, solid wires, or ferrules |
| **Applicable wire size** | 0.25 to 1.5 $mm^2$ (AWG24 to AWG16) |
| **Wire insertion force** | 8 N max. for AWG20 wire |
| **Screwdriver insertion force** | 15 N max. |
| **Wire stripping length** | 8 mm |
| **Ferrule length** | 8 mm |
| **Recommended flat-blade screwdriver** | XW4Z-00B (Omron)<br>SZF 0.4 × 2.5 (Phoenix Contact)<br>210-719 (Wago)<br>SDI 0.4 × 2.5 × 75 (Weidmuller) |
| **Current capacity** | 10 A (per pole) |
| **Number of insertions** | 50 times |
| **Case color** | N1.5 |
| **Case material** | PC, UL 94 V-0 |
| **Weight** | Approx. 100 g |
| **Mounting** | Mounts to DIN Track, or screw mounting |
| **Dimensions** | 17.5 × 90 × 90 mm (W×H×D) |

## Specifications

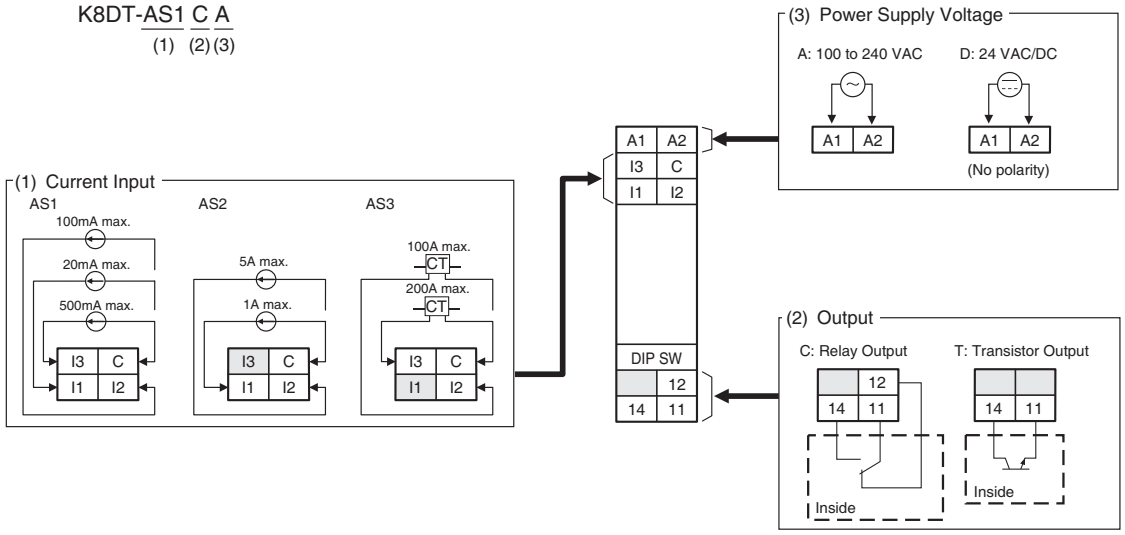
| | | |
|---|---|---|
| **Allowable operating voltage range** | | 85% to 110% of power supply voltage |
| **Allowable operating frequency range** | | 50/60 Hz ±5 Hz |
| **Input frequency range** | | K8DT-AS1 and K8DT-AS2:DC input or AC input (45 to 65 Hz)<br>K8DT-AS3: AC input (45 to 65 Hz) |
| **Overload capacity** | | K8DT-AS1 and K8DT-AS2:<br>Continuous input at 120% of maximum input, 1 s at 150%<br>K8DT-AS3:Continuous input at 120%, 30 s at 200%, and 1 s at 600% with an OMRON CT (K8AC-CT200L)<br>**Note:** Overload capacity of primary side of CT. |
| **Repeat error** | **Operating value** | ±0.5% full scale (at 25°C and 65% humidity, rated power supply voltage) |
| | **Operating time** | ±50 ms (at 25°C and 65% humidity, rated power supply voltage) |
| **Applicable standards** | **Conforming standards** | EN 60947-5-1<br>Installation environment (pollution level 2, Overvoltage category III) |
| | **EMC** | EN 60947-5-1 |
| | **Safety standards** | UL 60947-5-1 (Listing), Korean Radio Waves Act (Act 10564), CCC (GB/T 14048.5) ✻ |
| **Insulation resistance** | | 20 MΩ min.<br>Between external terminals and case<br>Between power supply terminals and input terminals<br>Between power supply terminals and output terminals<br>Between input terminals and output terminals |
| **Dielectric strength** | | 2,000 VAC for one minute<br>Between external terminals and case<br>Between power supply terminals and input terminals<br>Between power supply terminals and output terminals<br>Between input terminals and output terminals |
| **Impulse withstand voltage** | | 6 kV (between live terminals and exposed, non-charged metal parts) |
| **Noise immunity** | | Square-wave noise of 1-μs/100-ns pulse width with 1-ns rise time<br>100 to 240 VAC: 1,500 V power supply terminal common/normal mode<br>24 VAC: 1,500 V power supply terminal common/normal mode<br>24 VDC: 480 V power supply terminal common |
| **Vibration resistance** | | Frequency 10 to 55 Hz, 0.35-mm single amplitude<br>10 sweeps of 5 min each in X, Y, and Z directions |
| **Shock resistance** | | 100 $m/s^2$, 3 times each in 6 directions along 3 axes |
| **Degree of protection** | | Terminals: IP20 |

✻ K8DT-AS□TD is not applied.

# K8DT-AS

# Connections

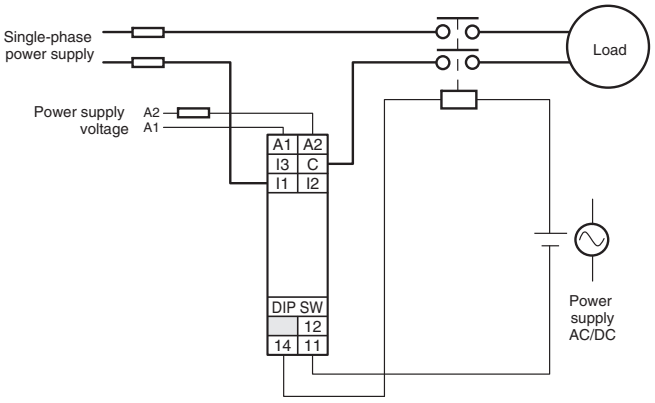
## Terminal Diagram



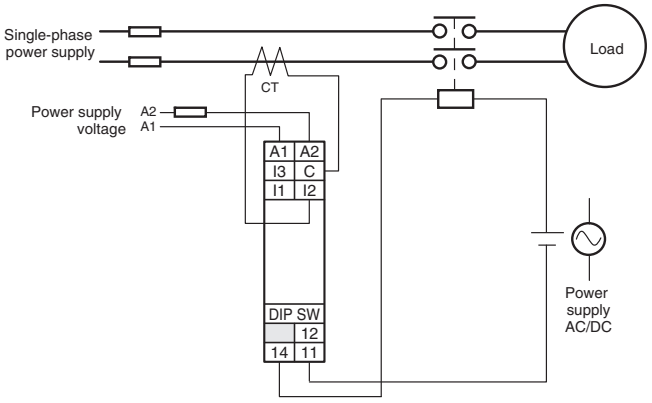

**Note: 1.** Do not connect anything to terminals that are shaded in gray.
**2.** There is no polarity for the DC power supply input.
**3.** For the current input, you can input only from the C terminal and one other terminal.
**4.** Refer to *Setting Ranges and Wiring Connections* on the I1, I2, and I3 current input terminals.
**5.** The K8DT-AS3 is designed to be used in combination with the OMRON K8AC-CT200L Current Transformer (CT).

## Wiring Example

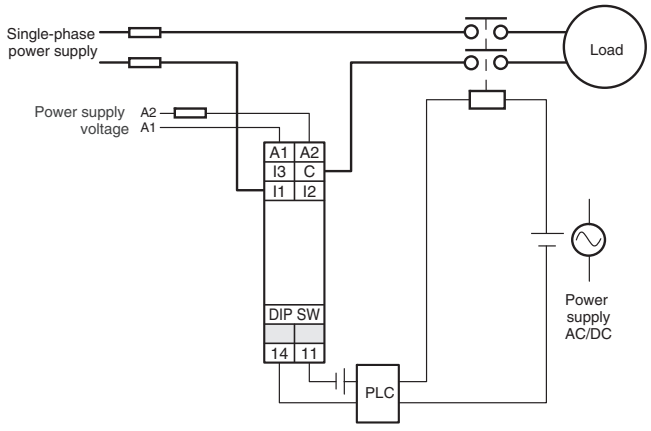
### Directly Inputting a Current




### Using a CT




### Transistor Output

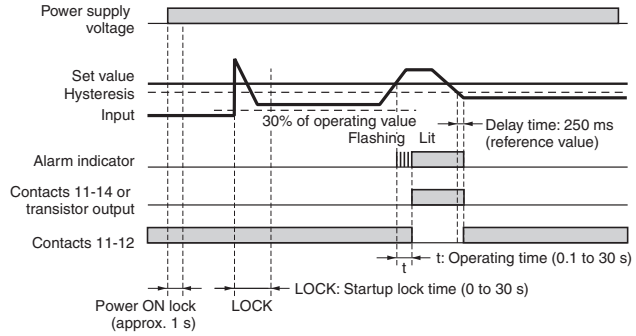



**Note:** Use copper wires with a rating of 75°C or an equivalent rating.

# Timing Charts

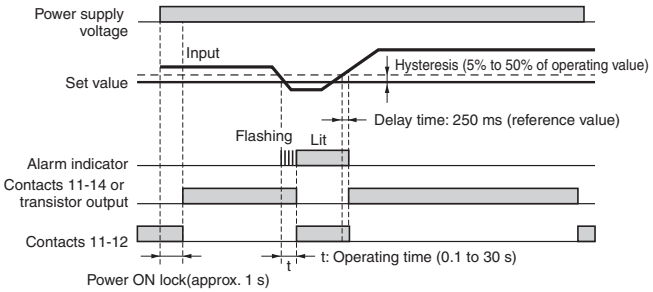
## Overcurrent Operation Diagram (Output Drive Method: Normally Open)

**DIP switch setting: SW3 OFF, SW4 OFF**



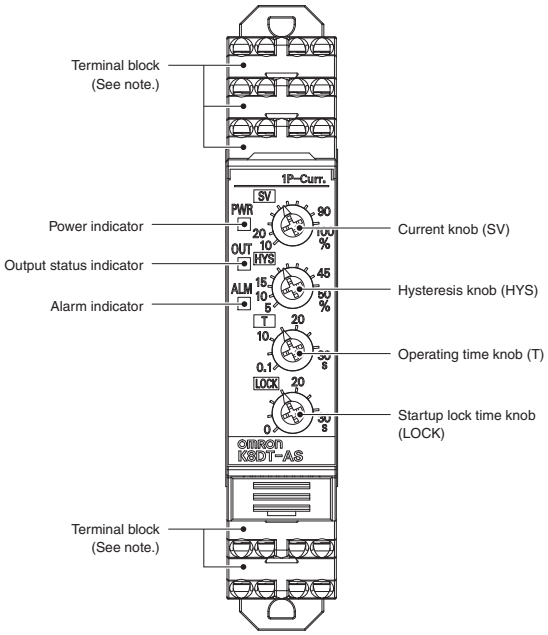

## Undercurrent Operation Diagram (Output Drive Method: Normally Closed)

**DIP switch setting: SW3 ON, SW4 ON**

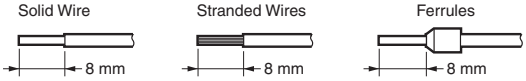



# Nomenclature

## Front




**Note:** Use solid wires, stranded wires, or ferrules to connect to the terminals.
To maintain the withstand voltage after connecting the terminals, insert 8 mm of exposed conductor into the terminal.




### Indicators

| Item | Meaning |
|---|---|
| **Power indicator (PWR: Green)** | Lit when power is being supplied. |
| **Output status indicator (Output: Yellow)** | Lights for output |
| **Alarm indicator (ALM: Red)** | Lit when there is an overcurrent or undercurrent.<br>The indicator flashes to indicate the error status after the input has exceeded the set value while the operating time is being clocked. |

### Setting Knobs

| Item | Usage |
|---|---|
| **Current knob (SV)** | Used to set the current to 10% to 100% of maximum setting range. |
| **Hysteresis knob (HYS)** | Used to set the rest value to 5% to 50% of the operating value. |
| **Operating time knob (T)** | Used to set the operating time to 0.1 to 30 s. |
| **Startup lock time knob (LOCK)** | Used to set the startup lock time to 0 to 30 s. |

# Operation Methods

## Setting Ranges and Wiring Connections

| Model | Setting range | Input type | Wiring connections |
|---|---|---|---|
| K8DT-AS1 | 2 to 20 mA AC/DC | Direct input | I1-COM |
| | 10 to 100 mA AC/DC | Direct input | I2-COM |
| | 50 to 500 mA AC/DC | Direct input | I3-COM |
| K8DT-AS2 | 0.1 to 1 A AC/DC | Direct input or commercially available CT | I1-COM |
| | 0.5 to 5 A AC/DC | | I2-COM |
| K8DT-AS3 | 10 to 100 A AC ✻ | OMRON CT | I2-COM |
| | 20 to 200 A AC ✻ | OMRON CT | I3-COM |

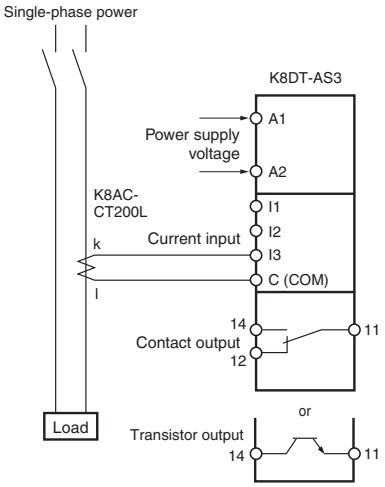
**Note:** The DC input terminals have no polarity.
✻ The K8DT-AS3 is designed to be used in combination with the OMRON K8AC-CT200L Current Transformer (CT). (Direct input is not possible.)

## Connections

### Input

Connect the input between the I1-COM, I2-COM, or I3-COM terminals, according to the input current. Malfunctions may occur if the input is connected to unused terminals and the Unit will not operate correctly.
For the K8DT-AS3, the I1 terminal is not used. For the K8DT-AS2, the I3 terminal is not used.
If using the OMRON K8AC-CT200L CT, connect to terminals k and l on the K8AC-CT200L. (Terminals kt and lt are not used.)

**<For K8DT-AS3>**



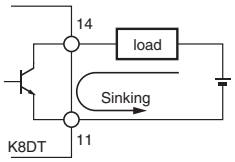

### Power Supply

Connect the power supply to terminals A1 and A2.

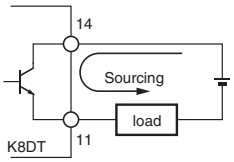
### Outputs

For a relay output, the SPDT contacts are output on terminals 11, 12, and 14. For a transistor output, the output is on terminals 11 and 14.
The internal circuit of the transistor output is NPN, but application is possible for either a sinking or sourcing output.

**In the case of sinking output applications**



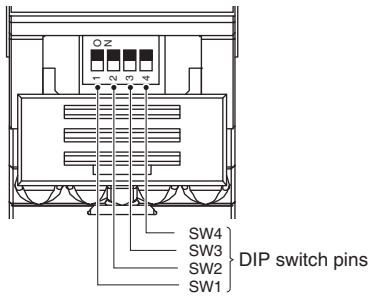

**In the case of sourcing output applications**




## DIP Switch Settings

The reset method, drive output method, and operating mode are set using the DIP switch located on the front of the Unit.
For the K8DT-AS□, SW1 is not used.

**Note:** Open the DIP switch cover to set the DIP switch.
Keep the DIP switch cover closed while the power supply to the Relay is ON.




### DIP Switch Functions

| Pin | ON ❍↑ / OFF ●↓ | 1 (ON / OFF) | 2 | 3 | 4 |
|---|---|---|---|---|---|
| Resetting method | Automatic reset | Not used. | ❍ | --- | --- |
| | Manual reset | | ● | --- | --- |
| Output drive method | Normally closed | | --- | ❍ | --- |
| | Normally open | | --- | ● | --- |
| Operating mode | Undercurrent | | --- | --- | ❍ |
| | Overcurrent | | --- | --- | ● |

**Note:** All pins are set to OFF by default.

# Setting Method

## Setting Current

The current knob (SV) is used to set the current.
The current can be set to 10% to 100% of the maximum setting range.
Turn the knob while there is an input to the input terminals until the alarm indicator flashes (when the set value and the input have reached the same level.)
Use this as a guide to set the current.
The maximum setting range will differ depending on the model and the input terminal.
Example: K8DT-AS3 Using Input Terminals I3-COM
The maximum setting range will be 200 A AC and the setting range will be 20 to 200 A.

## Hysteresis

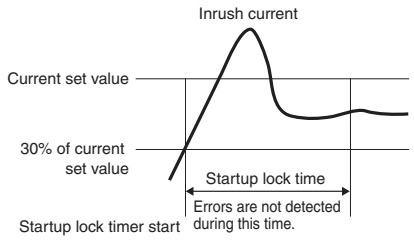
Hysteresis is set using the hysteresis knob (HYS)
The setting range is 5 to 50% of the operating value.
Example: Maximum of 200 A AC, Current Set Value (SV) of 50%, and Overcurrent Operation
Operation will be at 100 A and resetting at 90 A when the hysteresis (HYS) is set to 10%.

## Operating Time

The operating time is set using the operating time knob (T).
The operating time can be set to between 0.1 and 30 s.
If the input current exceeds (drops lower than) the set value, the alarm indicator will start flashing for the set period and then stay lit.

## Startup Lock Time

The startup lock time is set using the startup lock time knob (LOCK).
The startup lock time can be set to between 0 and 30 s.
The startup lock time will start when the input current reaches 30% or more of the set value.
Use startup lock time to prevent unwanted operation, e.g., as a result of inrush current.
**Note:** This function is valid only for overcurrent operation.



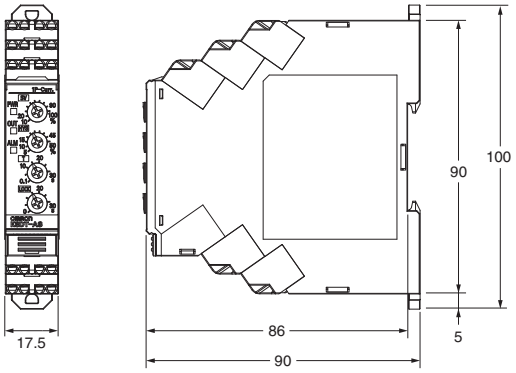
# K8DT-AS

## Dimensions

(Unit: mm)

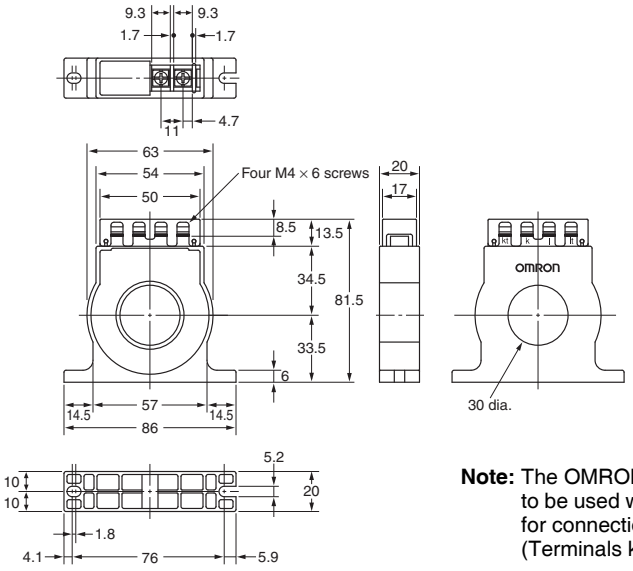
### Single-phase Current Relays

**K8DT-AS1**
**K8DT-AS2**
**K8DT-AS3**

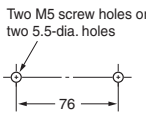



### OMRON CT

**K8AC-CT200L**




**Mounting Hole Dimensions**

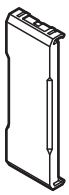


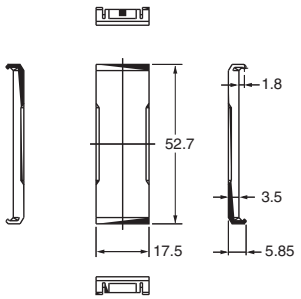

**Note:** The OMRON Current Transformer (CT) is designed to be used with the K8DT-AS3. Use terminals k and l for connections.
(Terminals kt and lt are not used.)

### Options (Order Separately)

**Front Cover**

**Y92A-D1A**

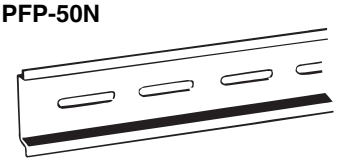


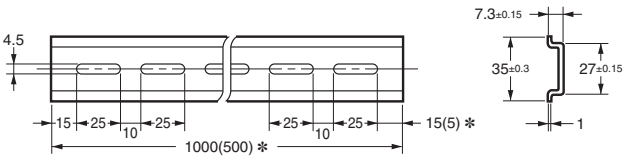



### Optional Parts for DIN Track Mounting

**DIN Tracks**

**PFP-100N**
**PFP-50N**






✻ Dimensions in parentheses are for the PFP-50N.