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Digital Smart Power

- Power Factor Controller
- Electrical Measurement
- Time Relay
- Liquid Level Controller
- Protection Relay

PRODUCT CATALOGUE 2023

ZHEJIANG HANNUO ELECTRIC CO.,LTD

Smart Electric Component Supplier

Zhejiang Hannuo Electric Co., Ltd. has been committed to providing customers with high-quality electrical products since its establishment. We mainly produce control relays, protection relays, measuring meters, power factor controller, AC contactors, circuit breakers, etc more than 200 general electrical products and products in power quality management.

Hannuo Electric's number one priority is to meet customer needs with quality products and outstanding reliability. We emphasize continuous design and productivity improvements to provide real value to our customers.

We will keep in touch with our customers with a modest heart based on the business philosophy of "fine and specialized", and promise to do our best to create the highest satisfaction and achievement in everything with our customers.

All of us at Hannuo Electric are committed to continuously challenging and innovating in creating customer value and becoming a more reliable global company.

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Power Factor Controller

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Power Factor Controller
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PFR-12
Power Factor Controller
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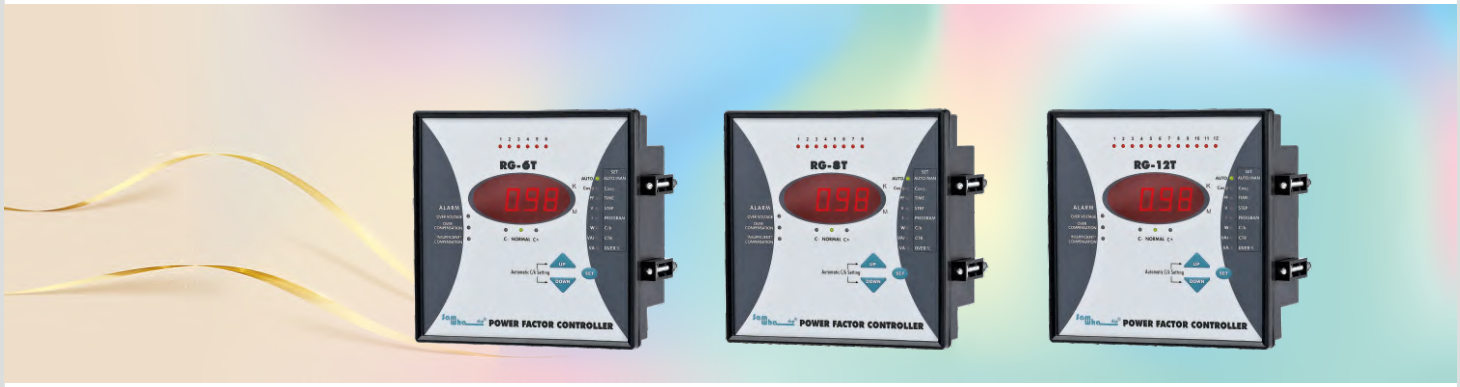
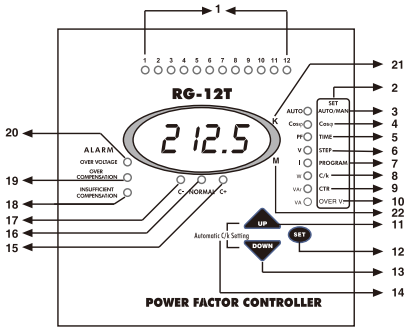
RG-6T, RG-8T, RG-12T

Power Factor Controller





General Description

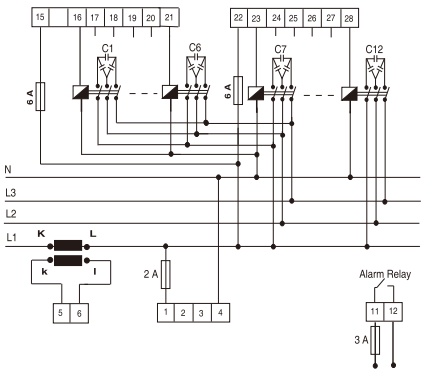
Power Factor Controllers are used for measurement and control of power factor control units for central reactive power compensation. The Power Factor measured by RG-T is compared with the set point values and in order to provide necessary compensation, Power Factor Controller switches capacitor banks ON and OFF automatically. RG-T is a micro controller relay, designed for above application in 144x144 case for flush mounting with rear plug-in connectors. In addition to displaying the systems Cosφ in Automatic Operating Mode, RG-T displays the RMS values of Voltage(V) and Current (I), Active Power (W), Reactive Power (VAr) and Apparent Power (VA) of measuring phase.

Front Panel Specifications

1. 1, 2.....12 : Shows the status of each capacitor steps.
2. Set menu : Shows the menu options that correspond to the lights.
3. Auto/Man light : If this light is continuously ON, RG-T is in automatic mode. If it is blinking, RG-T is in manual mode. By pressing SET button 3 seconds, you enter to menu and change operating Mode.
4. Cos ϕ light : By pressing SET button seconds; Cos ϕ adjustment can be made by selecting this light.
   In automatic mode, when cos light is selected by pressing UP and DOWN buttons,system's cos ϕ and ind/cap state is displayed.
5. TIME/PF Light : By pressing SET button 3 seconds; you enter to menu and step time adjustment is made by selecting this light.
   In automatic mode, when this light is selected by pressing UP and DOWN buttons, system's power factor is displayed.
6. STEP/V Light : By pressing SET button 3 seconds; you enter to menu and step number adjustment is made by selecting this light.
   In automatic mode, when this light is selected by pressing UP and DOWN buttons phase voltage (V) is displayed.
7. PROGRAM/I Light : By pressing SET button 3 seconds; you enter to menu and power sequence adjustment is made by selecting this light.
   In automatic mode, when this light is selected by pressing UP and DOWN buttons phase current (I) is displayed.
8. C/k-W Light : By pressing SET button 3 seconds; you enter to menu and manual C/k adjustment is made by selecting this light.
   In automatic mode,when this light is selected by pressing UP and DOWN buttons, system's active power (W) is displayed.
9. CTR-VAr Light : By pressing SET button 3 seconds; you enter to menu and current transformer primary value is made by selecting this light.
   In automatic mode,when this light is selected by pressing UP and DOWN buttons, system's reactive power (VAr) is displayed.
10. Over V. /VA Light : By pressing SET button 3 seconds; you enter to menu and protection of capacitor steps against over voltage function is made by selecting this light.
    In automatic mode,when this light is selected by pressing UP and DOWN buttons, system's apparent power (VA) is displayed.
11. UP button : To move up in the menu.
12. SET button : Enter button for different settings and values.
13. DOWN button : To move down in the menu.
14. Automactic C/k setting : Automatical C/k adjustment is started by pressing UP and DOWN buttons together at the same time.
15. C+Light : This light is ON when RG-T switches capacitor steps on.
16. NORMAL Light : This light is ON when the targeted compensation is achieved.
17. C- Light : This light is ON when RG-T switches capacitor steps off.
18. Insufficient Compensation Light : This warning light is ON when insufficient compensation occurs.

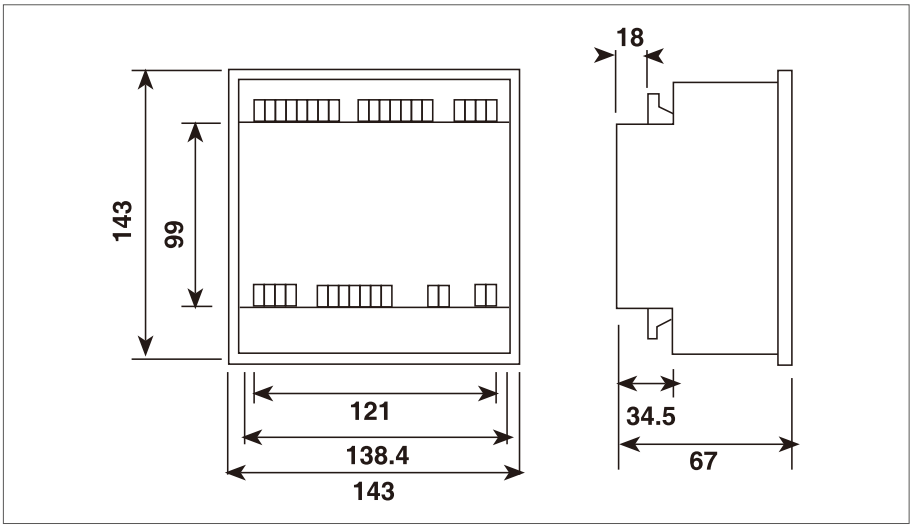
19. Over Compensation Light : This warning light is ON when over compensation occurs.
20. Over Voltage Light : This warning light is ON when over voltage occurs.
21. K(Kilo) Light : When this light is ON displayed value must be multiplied by 1000.
22. M(Mega) Light : When this light is ON displayed value must be multiplied by 10^6.

Phase-Neutral Connection*



Specifications

Operating Voltage(Un)	220VAC
Operating Frequency	50/60Hz
Operating Power	<10VA
Operating Temperature	-20°C ~ 55°C
Manual C/K Setting	0.02 ~ 1.0
Cosφ Setting	0.85(ind.) ~ 1.00
Time Delay	2 ~ 1800 sec.
Over Voltage Setting Range	240 ~ 275VAC
Current Measurement Range	50mA - 5,5A AC
Current Transformer	5 ~ 10000/5A (...x5)
Measurement Precision	±1%(V,I,COSφ); ±2%(W,VAr,VA)
Voltage Measurement Range	10 ~ 500V AC
Display	4 digit, Red display
Connection Type	Plug-in Terminal
Cable Diameter	2.5mm²
Weight	<920gr.
Panel Hole Sizes	139x139mm
Mounting	Front panel mounted.
Protection Class	IP40
Operating Altitude	<2000 meter



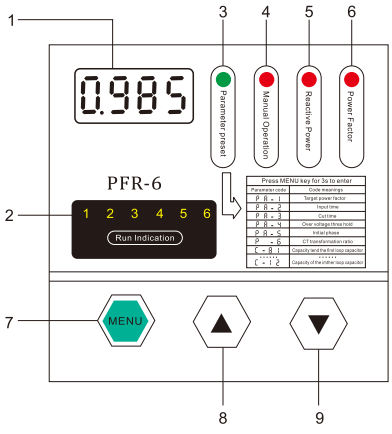
Ordering

R G - 1 2 T
① ②

①	Model		
②	Steps	6T	6 Steps
		8T	8 Steps
		12T	12 Steps

PFR-6, PFR-12

Power Factor Controller



General Description

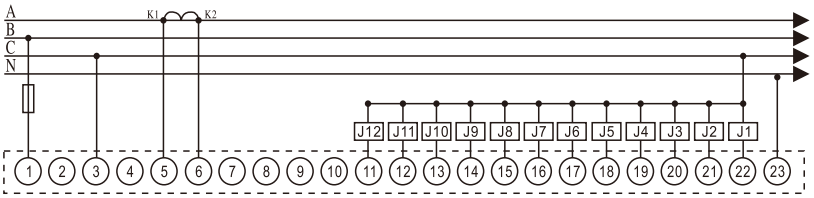
Power Factor Controllers are used for measurement and control of power factor control units for central reactive power compensation. The Power Factor measured by PFR is compared with the set point values and in order to provide necessary compensation, Power Factor Controller switches capacitor banks ON and OFF automatically.

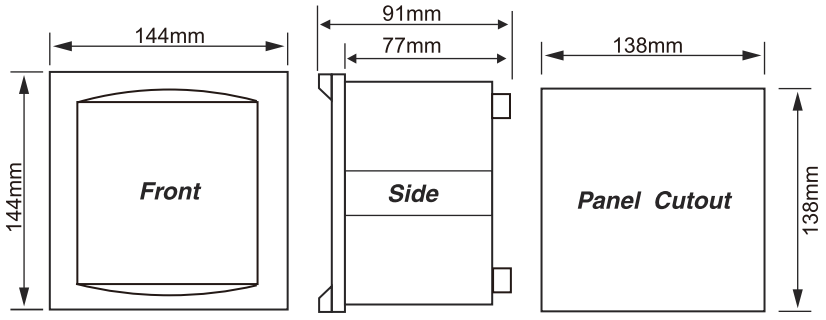
Front Panel Specifications

1. Display : Shows the parameter values and setting values.
2. 1, 2.....12 : Shows the status of each capacitor steps.
3. Parameter preset Light : Light up after entering the parameter settings
4. Manual Operation Light : Light up after entering the manual input/cut of the capacitors
5. Reactive power Light : Light up after select display reactive power.
6. Power factor Light : Displays the current power factor
7. MENU button : Main menu and submenu for option. Note: Press menu key for 3sec. to enter into parameter preset menu.
8. ▲ button : Preset parameter to increase the data, input capacitor groupwhen for manual run.
9. ▼ button : Preset parameter to decrease the data, cut capacitor group whenfor manual run.
   Under menu "Power factor" display primary current
   Under menu "Reactive power" display voltage signal

Specifications

Operating Voltage(Un)	380VAC
Operating Frequency	50/60Hz
Operating Power	<10VA
Operating Temperature	-20°C ~ 55°C
Cosφ Setting	0.85(ind.) ~ 1.00
Capacitor Input Time Delay	1 ~ 250 sec.
Capacitor Cut Time Delay	1 ~ 250 sec.
Over Voltage Setting Range	400 ~ 480VAC
Current Measurement Range	50mA ~ 5,5A AC
Capacitor capacity setting	0 ~ 100Kvar
Current Transformer	30 ~ 5000/5A (...x5)
Measurement Precision	±1%
Display	4 digit, Red display
Connection Type	Plug-in Terminal
Cable Diameter	2.5mm²
Weight	<870gr.
Panel Hole Sizes	138x138mm
Mounting	Front panel mounted.
Protection Class	IP40
Operating Altitude	<2000 meter





Ordering

P F R - 1 2 - V 1 · 0

① ② ③

①	Model		
②	Steps	6	6 Steps
		12	12 Steps
③	Compensation Mold	V1.0	Power Factor Compensation
		V2.0	Reactive Power Compensation

Measurement

TPM-01E
Energy Analyzer (3P&4W)
10/page

TPM-01E-60D/100D/250D
Energy Analyzer (3P&4W) (Included C.T)
12/page

TPM-01ES
Energy Analyzer (3P&4W)
14/page

TPM-01ES-60D/100D/250D
Energy Analyzer (3P&4W) (Included C.T)
16/page

TPM-01ESH
Energy Analyzer (3P&4W)
18/page

SDM-AVF96
Multimeter
30/page

SDM-AVF96D/109/209
Multimeter (Included C.T)
32/page

SDM-V96T
Three Phase Voltmeter (3P&4W)
34/page

SDM-V96S/V72S
Three Phase Voltmeter (3P&4W)
36/page

SDM-V96/V72/V48/V36
Voltmeter (3P&4W)
38/page

DA-XXX
Ammeter (Din-rail Type)
50/page

DA-XXD
Ammeter (Din-rail Type) (Included C.T)
52/page

DAV-96,DAV-72
Ammeter and Voltmeter
54/page

DAV-96D/72D/109/107/209/207
Ammeter and Voltmeter (Included C.T)
56/page

DAV-DIN
Ammeter and Voltmeter (Din-rail Type)
58/page

TPM-01ESH-60D/100D/250D
Energy Analyzer (3P&4W) (Included C.T)
20/page

EM-06
Multimeter (3P&4W)
22/page

EM-60D/100D/250D
Multimeter (3P&4W) (Included C.T)
24/page

SEM-06
Multimeter (3P&4W)
26/page

SEM-60D/100D/250D
Multimeter (3P&4W) (Included C.T)
28/page

DV-DIN
Voltmeter (3P&4W) (Din-rail Type)
40/page

SDM-A96T
Three Phase Ammeter
42/page

SDM-A96TD/A109T/A209T
Three Phase Ammeter (Included C.T)
44/page

SDM-A96/A72/A48/A36
Ammeter
46/page

SDM-A96D/A72D/A48D/A36D/A109/A107/A104/A103/A209/A207/A204/A203
Ammeter (Included C.T)
48/page

DAV-60/100/250
Ammeter and Voltmeter (Included C.T) (Din-rail Type)
60/page

SDM-F96 / F72 / F48 / F36
Frequencymeter
62/page

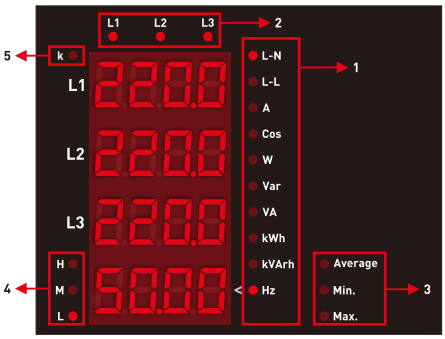
DF-DIN
Frequencymeter (Din-rail Type)
64/page

DA-VIP04
Adjustable Ammeter
66/page

DA-VIP-60D/100D/250D
Adjustable Ammeter (Included C.T)
68/page

TPM-01E

Energy Analyzer (3P&4W)



1-Shows the unit of the value.
L-N: Phase-Neutral Voltage,
L-L: Phase-Phase Voltage,
A: Current,
Cos: Cosinus Fi and Power Factor,
W: Watt(Active Power),
(If it is shown with"-",it is Export Active Power.),
Var: Reactive Power,
(If it is shown with"-",it is Capacitive Power.),
VA: Apparent Power,
kWh: Active Energy,
kVArh: Reactive Energy,
(If it is shown with"-",it is Capacitive Energy.),
Hz: Frequency,
2- Shows which phase the value belongs to.(L1,L2,L3)
3- Specifies the type of value shown.Minimum.maximum, average.
Min.: Indicates that the values shown are minimum.(Period: 2 seconds.)
Max.: Indicates that the values shown are maximum.(Period: 2 seconds.)
Average: Indicates that the values shown are minimum.
(Period: 5 minutes.)
4- It shows the magnitude of the current value drawn from the system.
L: This LED will light if the current value in any phase is 1A or less.
M: This LED will light if the current value in any phase is between 1A and 4A.
H: This LED will light if the current value in any phase is 4A or above.
5- When the value shown on the screen is greater than 9999, the "k" led lights on.
Ex.: When the voltage value in the system is 34500V, the value to be read on the screen will be 34.50.

ESC: Press this button while in menu to exit the menu without saving the values. When this button is pressed while not in the menu, the screen always shows figure-3.

SET: This button enters menu/parameter.It records the changes of parameters and remove from parameter.

DOWN: This button enters to fast progress between the values that are measured out of menu.Changes the value while inside the parameters in the menu.

RIGHT: This button allows to progress by displaying the measured values outside the menu together with the details. It allows navigation between parameters when pressed in menu. In the parameter,it allows to transition between steps and parameters.

General Description

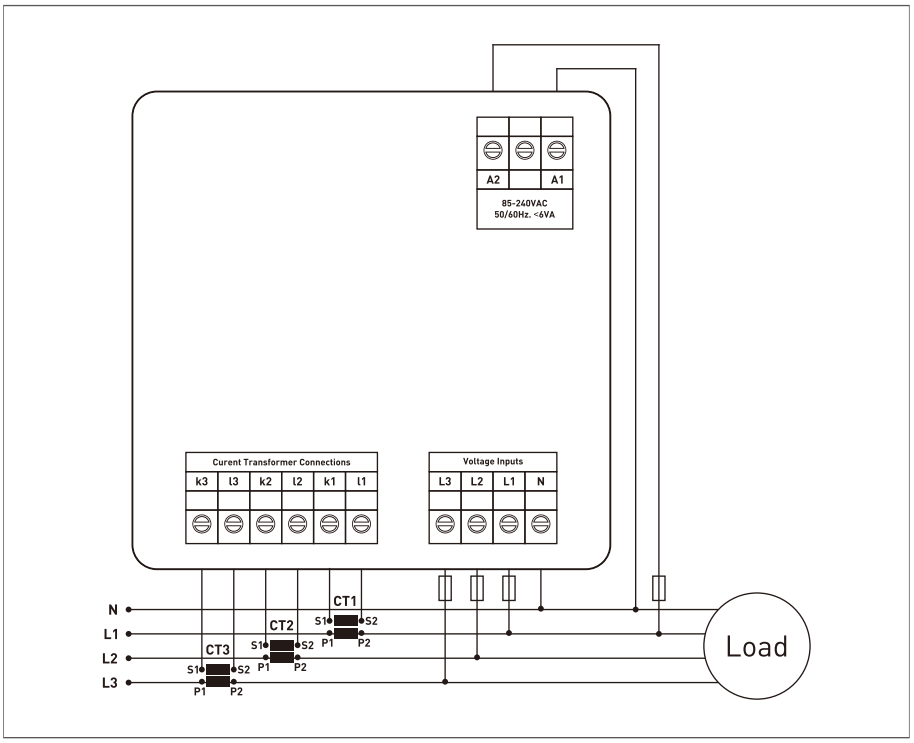
TPM-01E Energy analyzers measures load or voltage, current, cosφ, active power, reactive power, minimum and maximum values of the load.

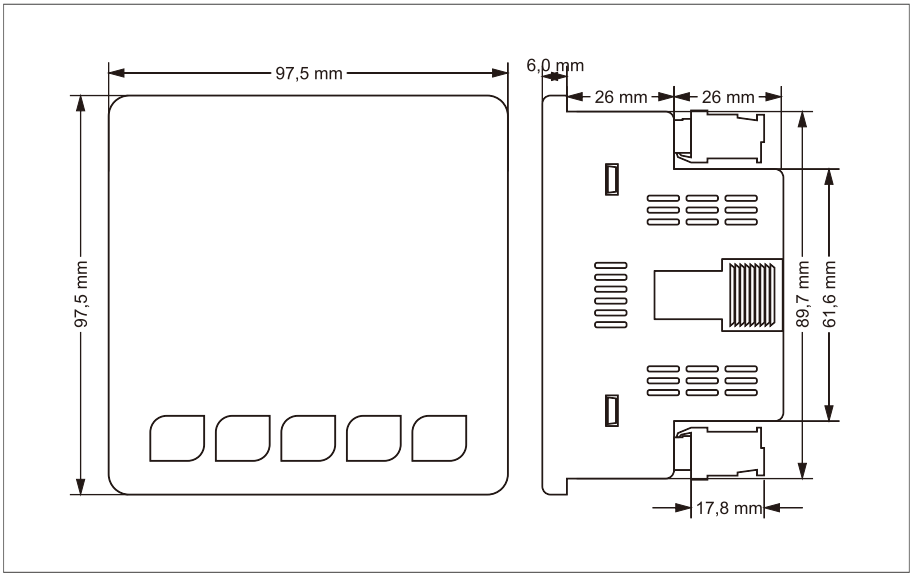
Features

- Easy Installation and Operation with 4×4 Digit Display
- With 3-Phase Voltage and 3-Phase Current Transformers
- Easy-To-Use Menu
- It Shows Per-Phase Active Powers (P)
- It Shows Per-Phase Total Reactive Powers (Q, ΣQ Inductive and Capacitive)
- It Shows Per-Phase Apparent Powers (S)
- It Shows Cosφ and Power Factor Values of Each Phase
- It Shows Voltage (V) and Current (I) Values of Each Phase
- It Shows Total Import and Export Active Energy (ΣkWh) Values
- It Shows Total Inductive and Capacitive Reactive Energy (ΣkVArh) Values
- It Shows the Minimum and Maximum Values
- Can Reset the Energy Values
- Password Protected Menu

Specifications

Operating Voltage(Un)	85V ~ 240V AC
Operating Frequency	50/60Hz.
Operating Power	<10VA
Operating Temperature	-20°C ~ 55°C
Voltage Input	5V ~ 330V AC
Voltage Meas. Range	5V ~ 330kV
Current Input	10mA ~ 5.5A
Current Meas. Range	10mA ~ 5.500A
Voltage, Current Accuracy	%±0.5
Active Accuracy	%±1
Reactive Accuracy	%±2
Supported Connection	3P4W
Current Transformer Ratio	1....1000
Voltage Transformer Ratio	1,0....999,9
Display	4x4 Digit 14mm LED Display 20xLEDs
Weigh	<300gr.
Protection Class	IP41(Font Panel), IP20(Body)
Panel Hole Sizes	91mm x 91mm
Connection Type	Plug-in terminal connection
Cable Diameter	1.5mm².
Mounting	Mounting on panel front cover
Operating Altitude	<2000meters





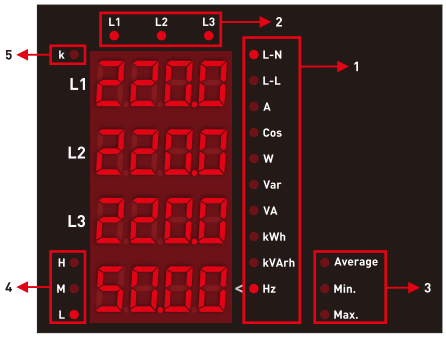
Ordering

T	P	M	-	0	1	E
		①				

①	Type	

TPM-01E-60D,TPM-01E-100D,TPM-01E-250D

Energy Analyzer (3P&4W) (Included C.T)



1-Shows the unit of the value.
L-N: Phase-Neutral Voltage,
L-L: Phase-Phase Voltage,
A: Current,
Cos: Cosinus Fi and Power Factor,
W: Watt(Active Power),
(If it is shown with"-",it is Export Active Power.),
Var: Reactive Power,
(If it is shown with"-",it is Capacitive Power.),
VA: Apparent Power,
kWh: Active Energy,
kVArh: Reactive Energy,
(If it is shown with"-",it is Capacitive Energy.),
Hz: Frequency,
2- Shows which phase the value belongs to.(L1,L2,L3)
3- Specifies the type of value shown. Minimum. maximum, average.
Min.: Indicates that the values shown are minimum.(Period: 2 seconds.)
Max.: Indicates that the values shown are maximum.(Period: 2 seconds.)
Average: Indicates that the values shown are minimum. (Period: 5 minutes.)
4- It shows the magnitude of the current value drawn from the system.
L: This LED will light if the current value in any phase is less 1A(60D) 10A(100D),10A(250D).
M: This LED will light if the current value in any phase is between 1A and 63A(60D),10A and 100A(100D),10A and 250A(250D).
H: This LED will light if the current value in any phase is above 63A(60D) 100A(100D) ,250A(250D).
5- When the value shown on the screen is greater than 9999, the "k" led lights on.
Ex.: When the voltage value in the system is 34500V, the value to be read on the screen will be 34.50.

ESC: Press this button while in menu to exit the menu without saving the values. When this button is pressed while not in the menu, the screen always shows figure-3.

SET: This button enters menu/parameter.It records the changes of parameters and remove from parameter.

DOWN: This button enters to fast progress between the values that are measured out of menu.Changes the value while inside the parameters in the menu.

RIGHT: This button allows to progress by displaying the measured values outside the menu together with the details. It allows navigation between parameters when pressed in menu. In the parameter,it allows to transition between steps and parameters.

General Description

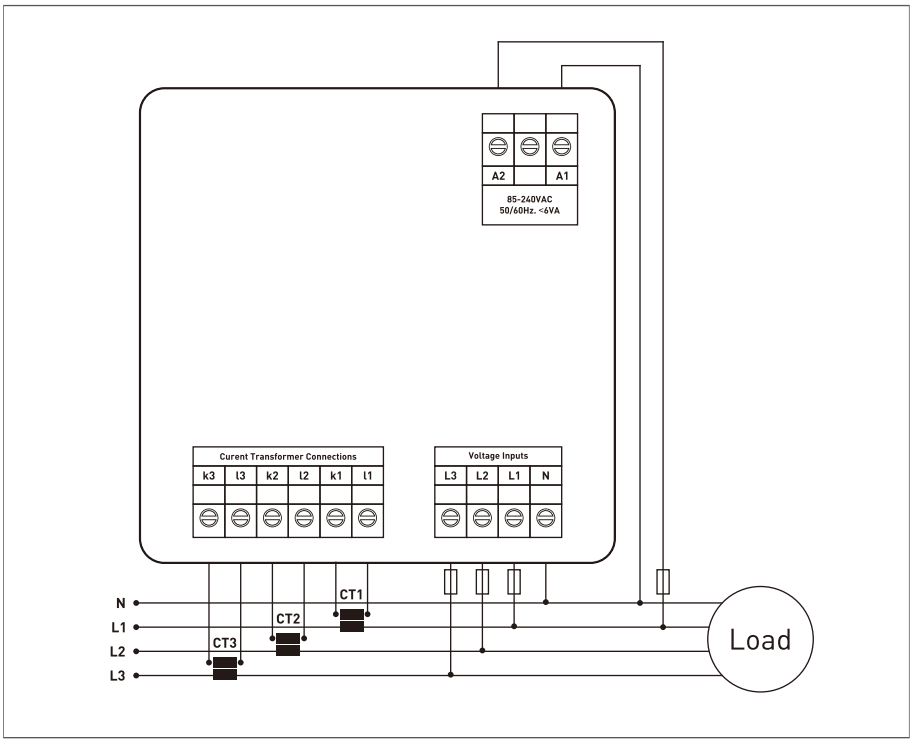
TPM-01E Energy analyzers measures load or voltage, current, cosφ, active power, reactive power, minimum and maximum values of the load and also measures demands.

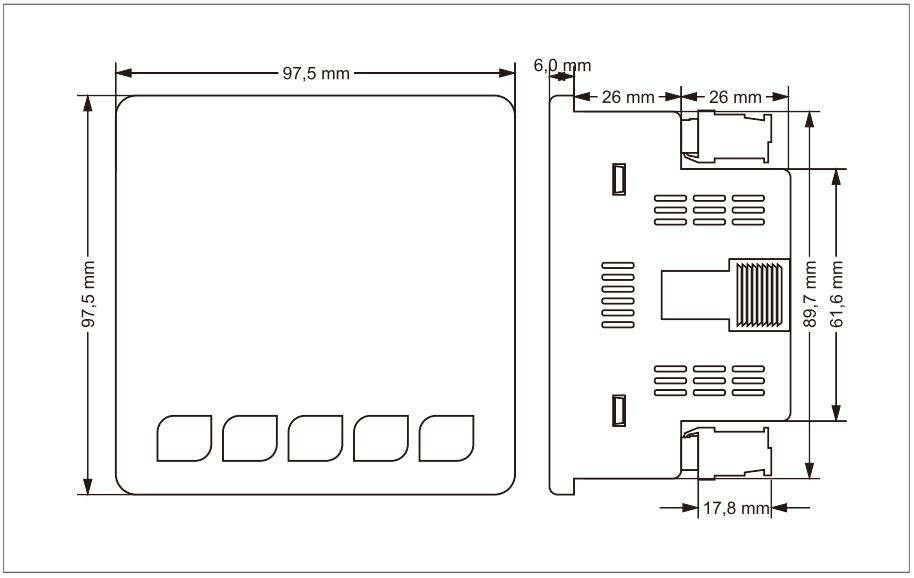
Features

- Easy Installation and Operation with 4×4 Digit Display
- With 3-Phase Voltage and 3-Phase Current Transformers
- Easy-To-Use Menu
- It Shows Per-Phase Active Powers (P)
- It Shows Per-Phase Total Reactive Powers (Q, ΣQ Inductive and Capacitive)
- It Shows Per-Phase Apparent Powers (S)
- It Shows Cosφ and Power Factor Values of Each Phase
- It Shows Voltage (V) and Current (I) Values of Each Phase
- It Shows Total Import and Export Active Energy (ΣkWh) Values
- It Shows Total Inductive and Capacitive Reactive Energy (ΣkVArh) Values
- It Shows the Minimum and Maximum Values
- Can Reset the Energy Values
- Password Protected Menu

Specifications

Operating Voltage(Un)	85V ~ 240V AC
Operating Frequency	50/60Hz.
Operating Power	<10VA
Operating Temperature	-20°C ~ 55°C
Voltage Input	5V ~ 330V AC
Voltage Meas. Range	5V ~ 330kV
Current Meas. Range	1 ~ 63A(60D),10 ~ 100A(100D), 10 ~ 250A(250D)
Voltage, Current Accuracy	%±0.5
Active Accuracy	%±1
Reactive Accuracy	%±2
Supported Connection	3P4W
Voltage Transformer Ratio	1,0....999,9
Display	4x4 Digit 14mm LED Display 20xLEDs
Weigh	<370gr(60D); <490gr (100D); <530gr(250D)
Protection Class	IP41(Font Panel), IP20(Body)
Panel Hole Sizes	91mm x 91mm
Connection Type	Plug-in terminal connection
Cable Diameter	1.5mm².
Mounting	Mounting on panel front cover
Operating Altitude	<2000meters





Ordering

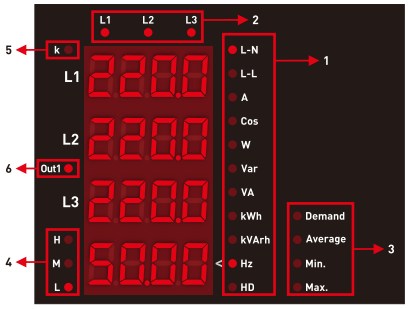
T P M - 0 1 E - 6 0 D

① ②

①	Type		
②	Current Range	60D	1 ~ 63A
		100D	10 ~ 100A
		250D	10 ~ 250A

TPM-01ES

Energy Analyzer (3P&4W) (RS485) (1 Relay Output)



1-Shows the unit of the value.
L-N: Phase-Neutral Voltage,
L-L: Phase-Phase Voltage,
A: Current,
Cos: Cosinus Fi and Power Factor,
W: Watt(Active Power),
(If it is shown with"-",it is Export Active Power.),
Var: Reactive Power,
(If it is shown with"-",it is Capacitive Power.),
VA: Apparent Power,
kWh: Active Energy,
kVArh: Reactive Energy,
(If it is shown with"-",it is Capacitive Energy.),
Hz: Frequency, **HD:** Harmonics.
2- Shows which phase the value belongs to.(L1,L2,L3)
3- Specifies the type of value shown.Minimum.maximum, average and demand.
Min.: Indicates that the values shown are minimum.(Period: 2 seconds.)
Max.: Indicates that the values shown are maximum.(Period: 2 seconds.)
Average: Indicates that the values shown are average.
(Period: 5 minutes.)
Demand: Indicates that the values shown are demand.
(Period: 15 minutes.)
4- It shows the magnitude of the current value drawn from the system.
L: This LED will light if the current value in any phase is 1A or less.
M: This LED will light if the current value in any phase is between 1A and 4A.
H: This LED will light if the current value in any phase is 4A or above.
5- When the value shown on the screen is greater than 9999, the "k" led lights on.
Ex.: When the voltage value in the system is 34500V, the value to be read on the screen will be 34.50.
6- Shows the status of the relay.
Ex.: If the out led is on, the out contact is active(energised),if the led is off, it is passive(de-energised).
Ex.: In the above screen the phase-neutral voltage values and Hz(frequency) value of L1,L2 and L3 are shown.The current drawn from the system is between 0A and 1A and Out 1 contact is active.

ESC: Press this button while in menu to exit the menu without saving the values.
When this button is pressed while not in the menu, the screen always shows figure-3.

SET: This button enters menu/parameter.It records the changes of parameters and remove from parameter.

DOWN: This button enables to fast progress between the values that are measured out of menu.Changes the value while inside the parameters in the menu.

RIGHT: This button allows to progress by displaying the measured values outside the menu together with the details. It allows navigation between parameters when pressed in menu.
In the parameter,it allows to transition between steps and parameters.

General Description

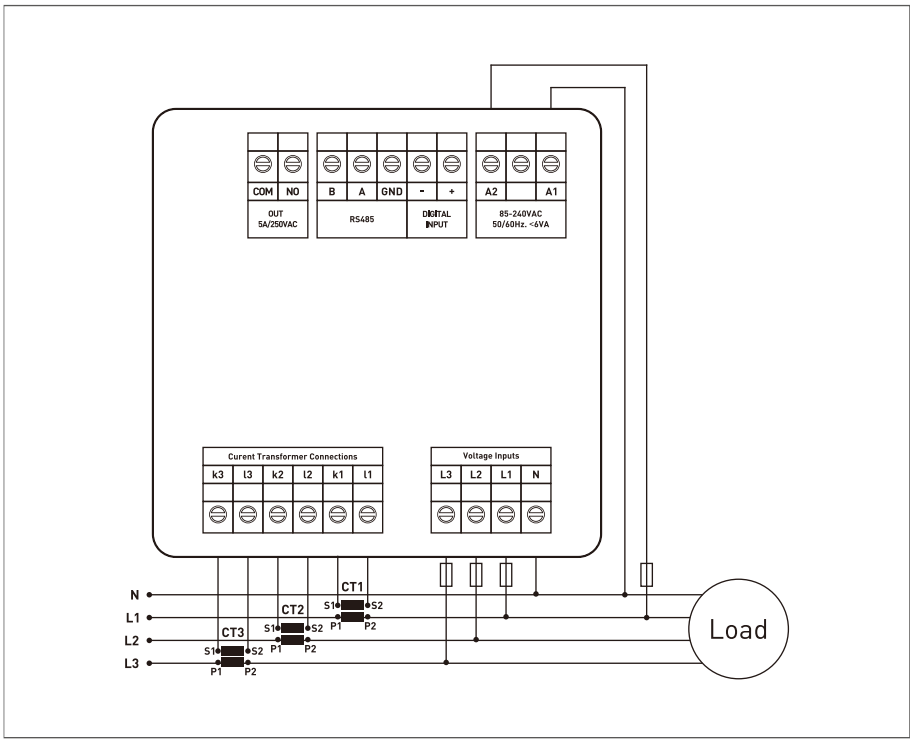
TPM-01ES Energy analyzers measures load or voltage, current, cosφ, active power, reactive power, minimum and maximum values of the load and also measures demands.

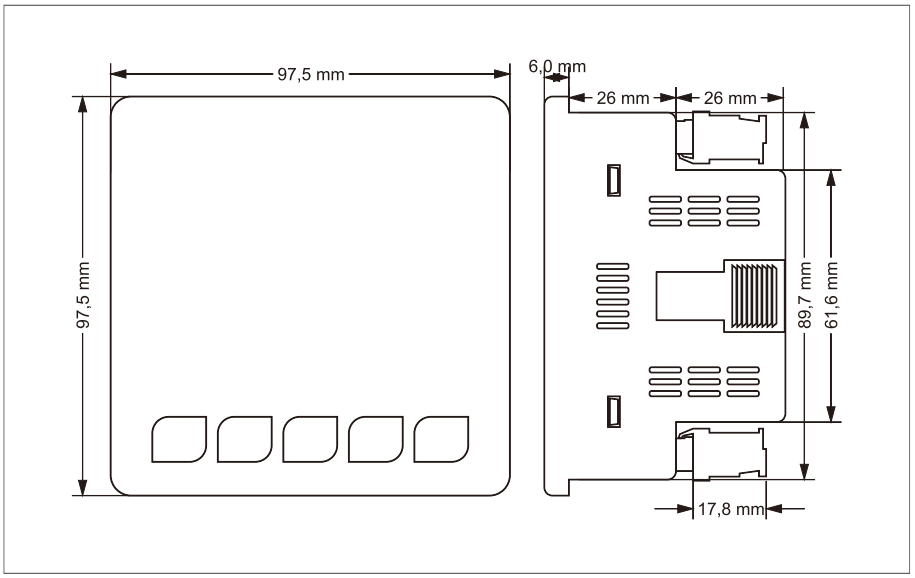
Features

- Easy Installation and Operation with 4×4 Digit Display
- With 3-Phase Voltage and 3-Phase Current Transformers
- Easy-To-Use Menu
- Remote Communication with RS485 (RS485 ModBus RTU)
- It Shows Per-Phase Active Powers (P)
- It Shows Per-Phase Total Reactive Powers (Q, ΣQ Inductive and Capacitive)
- It Shows Per-Phase Apparent Powers (S)
- It Shows Cosφ and Power Factor Values of Each Phase
- It Shows Voltage (V) and Current (I) Values of Each Phase
- It Shows Total Import and Export Active Energy (ΣkWh) Values
- It Shows Total Inductive and Capacitive Reactive Energy (ΣkVArh) Values
- It Shows the Minimum and Maximum Values
- It Shows Demand Values
- Can Reset the Energy Values
- Password Protected Menu
- 1 Relay Output (Adjustable)
- Event Records (High/Low Voltage/Current, Voltage/Current Imbalance, THD-I)

Specifications

Operating Voltage(Un)	85V ~ 240V AC
Operating Frequency	50/60Hz.
Operating Power	<10VA
Operating Temperature	-20°C ~ 55°C
Voltage Input	5V ~ 330V AC
Voltage Meas. Range	5V ~ 330kV
Current Input	10mA ~ 5.5A
Current Meas. Range	10mA ~ 5.500A
Voltage, Current Accuracy	%±0.5
Active Accuracy	%±1
Reactive Accuracy	%±2
Supported Connection	3P4W
Current Transformer Ratio	1....1000
Voltage Transformer Ratio	1,0....999,9
Communication	RS485 MODBUS RTU
Baudrate	1200bps ~ 38400bps
Stop Bit	1 or 2
Parity	None, Even, Odd
Display	4x4 Digit 14mm LED Display 23xLEDs
Weigh	<300gr.
Protection Class	IP41(Font Panel), IP20(Body)
Panel Hole Sizes	91mm x 91mm
Connection Type	Plug-in terminal connection
Cable Diameter	1.5mm².
Mounting	Mounting on panel front cover
Operating Altitude	<2000meters





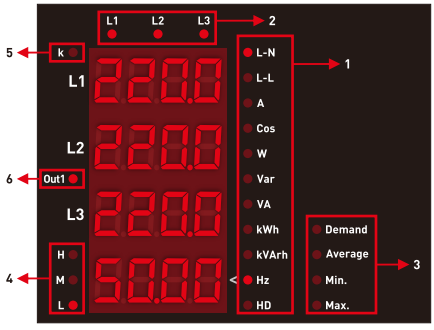
Ordering

T	P	M	-	0	1	E	S
①							

①	Type	

TPM-01ES-60D,TPM-01ES-100D,TPM-01ES-250D

Energy Analyzer (3P&4W) (Included C.T) (RS485) (1 Relay Output)



1-Shows the unit of the value.
L-N: Phase-Neutral Voltage,
L-L: Phase-Phase Voltage,
A: Current,
Cos: Cosinus Fi and Power Factor,
W: Watt(Active Power),
(If it is shown with"-",it is Export Active Power.),
Var: Reactive Power,
(If it is shown with"-",it is Capacitive Power.),
VA: Apparent Power,
kWh: Active Energy,
kVArh: Reactive Energy,
(If it is shown with"-",it is Capacitive Energy.),
Hz: Frequency, **HD:** Harmonics.
2- Shows which phase the value belongs to.(L1,L2,L3)
3- Specifies the type of value shown.Minimum.maximum, average and demand.
Min.: Indicates that the values shown are minimum.(Period: 2 seconds.)
Max.: Indicates that the values shown are maximum.(Period: 2 seconds.)
Average: Indicates that the values shown are average.
(Period: 5 minutes.)
Demand: Indicates that the values shown are demand.
(Period: 15 minutes.)
4- It shows the magnitude of the current value drawn from the system.
L: This LED will light if the current value in any phase is less 1A(60D) 10A(100D),10A(250D).
M: This LED will light if the current value in any phase is between 1A and 63A(60D),10A and 100A(100D),10A and 250A(250D).
H: This LED will light if the current value in any phase is above 63A(60D) 100A(100D) ,250A(250D).
5- When the value shown on the screen is greater than 9999, the "k" led lights on.
Ex.: When the voltage value in the system is 34500V, the value to be read on the screen will be 34.50.
6- Shows the status of the relay.
Ex.: If the out led is on, the out contact is active(energised),if the led is off, it is passive(de-energised).
Ex.: In the above screen the phase-neutral voltage values and Hz(frequency) value of L1,L2 and L3 are shown.The current drawn from the system is between 0A and 1A and Out 1 contact is active.

ESC: Press this button while in menu to exit the menu without saving the values.
When this button is pressed while not in the menu, the screen always shows figure-3.

SET: This button enters menu/parameter.It records the changes of parameters and remove from parameter.

DOWN: This button enables to fast progress between the values that are measured out of menu.Changes the value while inside the parameters in the menu.

RIGHT: This button allows to progress by displaying the measured values outside the menu together with the details. It allows navigation between parameters when pressed in menu. In the parameter,it allows to transition between steps and parameters.

General Description

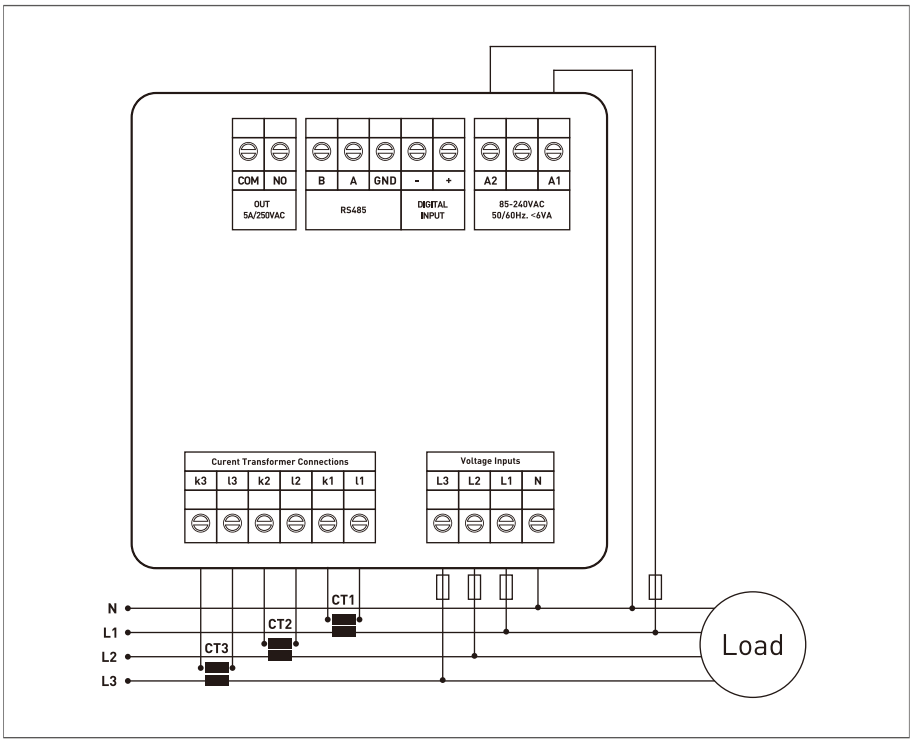
TPM-01ES Energy analyzers measures load or voltage, current, cosφ, active power, reactive power, minimum and maximum values of the load and also measures demands.

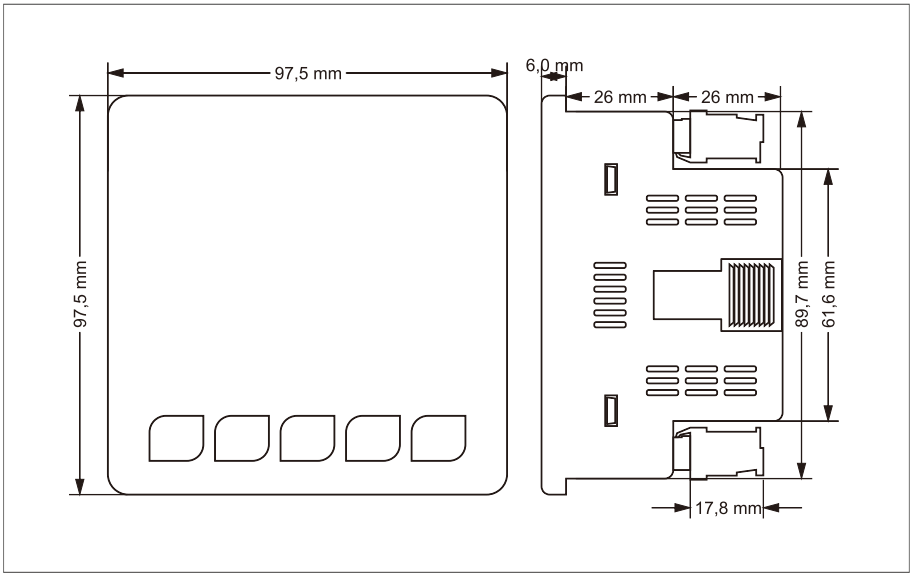
Features

- Easy Installation and Operation with 4×4 Digit Display
- With 3-Phase Voltage and 3-Phase Current Transformers
- Easy-To-Use Menu
- Remote Communication with RS485 (RS485 ModBus RTU)
- It Shows Per-Phase Active Powers (P)
- It Shows Per-Phase Total Reactive Powers (Q, ΣQ Inductive and Capacitive)
- It Shows Per-Phase Apparent Powers (S)
- It Shows Cosφ and Power Factor Values of Each Phase
- It Shows Voltage (V) and Current (I) Values of Each Phase
- It Shows Total Import and Export Active Energy (ΣkWh) Values
- It Shows Total Inductive and Capacitive Reactive Energy (ΣkVArh) Values
- It Shows the Minimum and Maximum Values
- It Shows Demand Values
- Can Reset the Energy Values
- Password Protected Menu
- 1 Relay Output (Adjustable)
- Event Records (High/Low Voltage/Current, Voltage/Current Imbalance, THD-I)

Specifications

Operating Voltage(Un)	85V ~ 240V AC
Operating Frequency	50/60Hz.
Operating Power	<10VA
Operating Temperature	-20°C ~ 55°C
Voltage Input	5V ~ 330V AC
Voltage Meas. Range	5V ~ 330kV
Current Meas. Range	1 ~ 63A(60D),10 ~ 100A(100D), 10 ~ 250A(250D)
Voltage, Current Accuracy	%±0.5
Active Accuracy	%±1
Reactive Accuracy	%±2
Supported Connection	3P4W
Voltage Transformer Ratio	1,0....999,9
Communication	RS485 MODBUS RTU
Baudrate	1200bps ~ 38400bps
Stop Bit	1 or 2
Parity	None, Even, Odd
Display	4x4 Digit 14mm LED Display 23xLEDs
Weigh	<380gr(60D); <500gr (100D); <540gr(250D).
Protection Class	IP41(Font Panel), IP20(Body)
Panel Hole Sizes	91mm x 91mm
Connection Type	Plug-in terminal connection
Cable Diameter	1.5mm².
Mounting	Mounting on panel front cover
Operating Altitude	<2000meters





Ordering

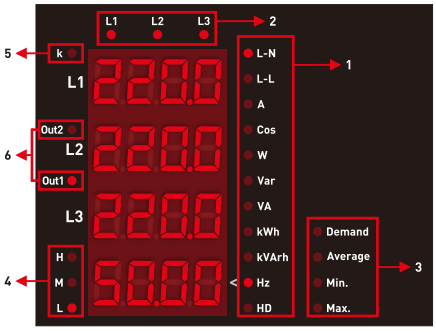
T P M - 0 1 E S - 6 0 D

① ②

①	Type		
②	Current Range	60D	1 ~ 63A
		100D	10 ~ 100A
		250D	10 ~ 250A

TPM-01ESH

Energy Analyzer (3P&4W) (RS485) (2 Relay Output)



1-Shows the unit of the value.
L-N: Phase-Neutral Voltage,
L-L: Phase-Phase Voltage,
A: Current,
Cos: Cosinus Fi and Power Factor,
W: Watt(Active Power),
(If it is shown with"-",it is Export Active Power.),
Var: Reactive Power,
(If it is shown with"-",it is Capacitive Power.),
VA: Apparent Power,
kWh: Active Energy,
kVArh: Reactive Energy,
(If it is shown with"-",it is Capacitive Energy.),
Hz: Frequency, **HD:** Harmonics.
2- Shows which phase the value belongs to.(L1,L2,L3)
3- Specifies the type of value shown.Minimum.maximum, average and demand.
Min.: Indicates that the values shown are minimum.(Period: 2 seconds.)
Max.: Indicates that the values shown are maximum.(Period: 2 seconds.)
Average: Indicates that the values shown are average.
(Period: 5 minutes.)
Demand: Indicates that the values shown are demand.
(Period: 15 minutes.)
4- It shows the magnitude of the current value drawn from the system.
L: This LED will light if the current value in any phase is 1A or less.
M: This LED will light if the current value in any phase is between 1A and 4A.
H: This LED will light if the current value in any phase is 4A or above.
5- When the value shown on the screen is greater than 9999, the "k" led lights on.
Ex.: When the voltage value in the system is 34500V, the value to be read on the screen will be 34.50.
6- Shows the status of the relay.
Ex.: If the out2 led is on, the out2 contact is active(energised),if the led is off,it is passive(de-energised).
Ex.: In the above screen the phase-neutral voltage values and Hz(frequency) value of L1,L2 and L3 are shown.The current drawn from the system is between 0A and 1A and Out 1 contact is active.

ESC: Press this button while in menu to exit the menu without saving the values.
When this button is pressed while not in the menu, the screen always shows figure-3.

SET: This button enters menu/parameter.It records the changes of parameters and remove from parameter.

DOWN: This button enables to fast progress between the values that are measured out of menu.Changes the value while inside the parameters in the menu.

RIGHT: This button allows to progress by displaying the measured values outside the menu together with the details. It allows navigation between parameters when pressed in menu.
In the parameter,it allows to transition between steps and parameters.

General Description

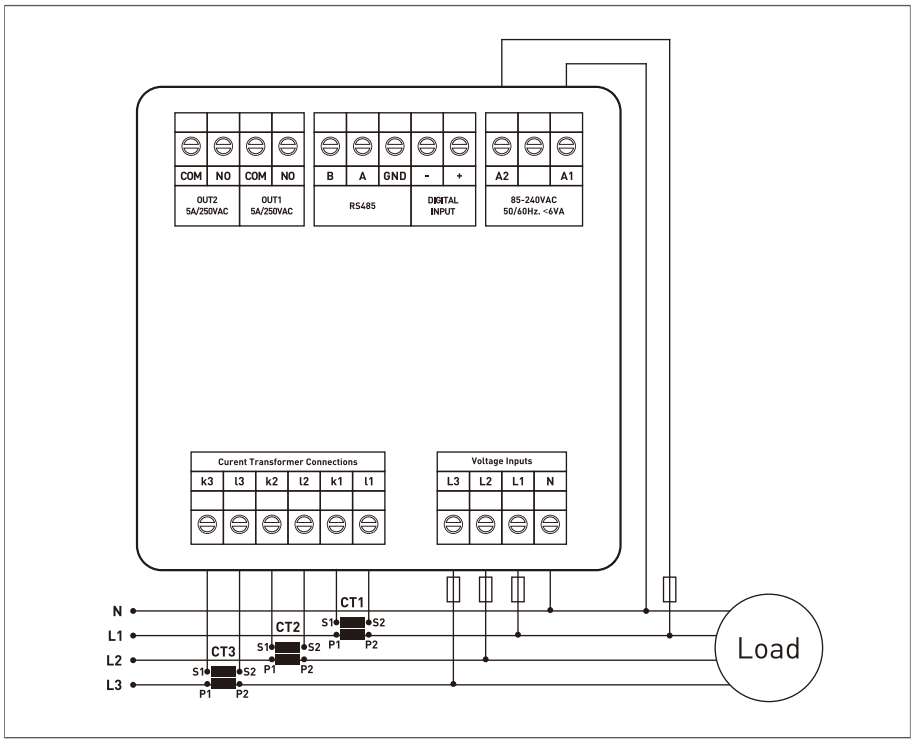
TPM-01ESH Energy analyzers measures load or voltage, current, cosφ, active power, reactive power, minimum and maximum values of the load and also measures demands.

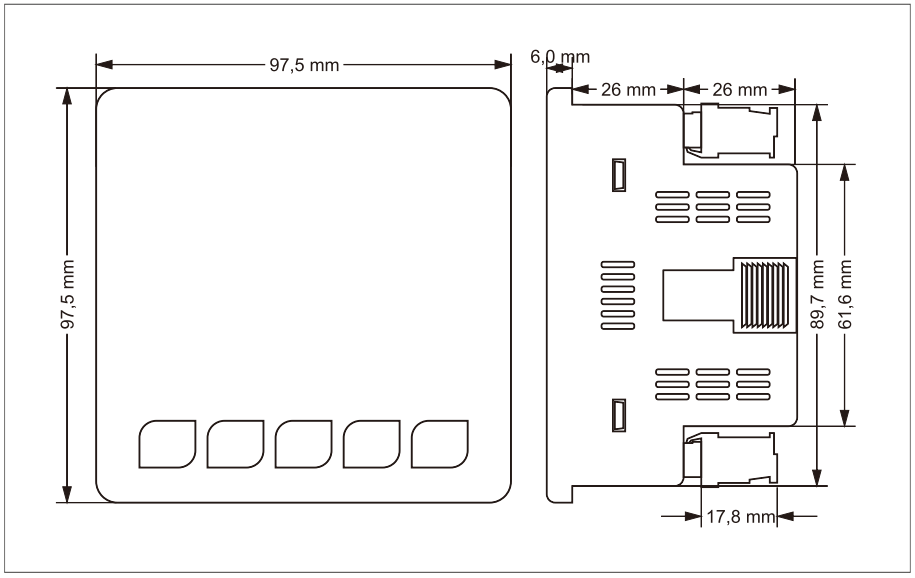
Features

- Easy Installation and Operation with 4×4 Digit Display
- With 3-Phase Voltage and 3-Phase Current Transformers
- Easy-To-Use Menu
- Remote Communication with RS485 (RS485 ModBus RTU)
- It Shows Per-Phase Active Powers (P)
- It Shows Per-Phase Total Reactive Powers (Q, ΣQ Inductive and Capacitive)
- It Shows Per-Phase Apparent Powers (S)
- It Shows Cosφ and Power Factor Values of Each Phase
- It Shows Voltage (V) and Current (I) Values of Each Phase
- It Shows Total Import and Export Active Energy (ΣkWh) Values
- It Shows Total Inductive and Capacitive Reactive Energy (ΣkVArh) Values
- It Shows the Minimum and Maximum Values
- It Shows Demand Values
- Can Reset the Energy Values
- Password Protected Menu
- 2 Relay Output (Adjustable)
- Event Records (High/Low Voltage/Current, Voltage/Current Imbalance, THD-I)

Specifications

Operating Voltage(Un)	85V ~ 240V AC
Operating Frequency	50/60Hz.
Operating Power	<10VA
Operating Temperature	-20°C ~ 55°C
Voltage Input	5V ~ 330V AC
Voltage Meas. Range	5V ~ 330kV
Current Input	10mA ~ 5.5A
Current Meas. Range	10mA ~ 5.500A
Voltage, Current Accuracy	%±0.5
Active Accuracy	%±1
Reactive Accuracy	%±2
Supported Connection	3P4W
Current Transformer Ratio	1....1000
Voltage Transformer Ratio	1,0....999,9
Communication	RS485 MODBUS RTU
Baudrate	1200bps ~ 38400bps
Stop Bit	1 or 2
Parity	None, Even, Odd
Display	4x4 Digit 14mm LED Display 24xLEDs
Weigh	<330gr.
Protection Class	IP41(Font Panel), IP20(Body)
Panel Hole Sizes	91mm x 91mm
Connection Type	Plug-in terminal connection
Cable Diameter	1.5mm².
Mounting	Mounting on panel front cover
Operating Altitude	<2000meters





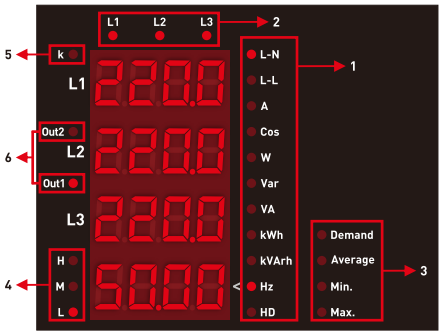
Ordering

T	P	M	-	0	1	E	S	H
①								

①	Type	

TPM-01ESH-60D/100D/250D

Energy Analyzer (3P&4W) (Included C.T) (RS485) (2 Relay Output)



1-Shows the unit of the value.
L-N: Phase-Neutral Voltage,
L-L: Phase-Phase Voltage,
A: Current,
Cos: Cosinus Fi and Power Factor,
W: Watt(Active Power),
(If it is shown with"-",it is Export Active Power.),
Var: Reactive Power,
(If it is shown with"-",it is Capacitive Power.),
VA: Apparent Power,
kWh: Active Energy,
kVArh: Reactive Energy,
(If it is shown with"-",it is Capacitive Energy.),
Hz: Frequency, **HD:** Harmonics.
2- Shows which phase the value belongs to.(L1,L2,L3)
3- Specifies the type of value shown.Minimum.maximum, average and demand.
Min.: Indicates that the values shown are minimum.(Period: 2 seconds.)
Max.: Indicates that the values shown are maximum.(Period: 2 seconds.)
Average: Indicates that the values shown are average.
(Period: 5 minutes.)
Demand: Indicates that the values shown are demand.
(Period: 15 minutes.)
4- It shows the magnitude of the current value drawn from the system.
L: This LED will light if the current value in any phase is less 1A(60D) 10A(100D),10A(250D).
M: This LED will light if the current value in any phase is between 1A and 63A(60D),10A and 100A(100D),10A and 250A(250D).
H: This LED will light if the current value in any phase is above 63A(60D) 100A(100D) ,250A(250D).
5- When the value shown on the screen is greater than 9999, the "k" led lights on.
Ex.: When the voltage value in the system is 34500V, the value to be read on the screen will be 34.50.
6- Shows the status of the relay.
Ex.: If the out2 led is on, the out2 contact is active(energised),if the led is off,it is passive(de-energised).
Ex.: In the above screen the phase-neutral voltage values and Hz(frequency) value of L1,L2 and L3 are shown.The current drawn from the system is between 0A and 1A and Out 1 contact is active.

ESC: Press this button while in menu to exit the menu without saving the values.
When this button is pressed while not in the menu, the screen always shows figure-3.

SET: This button enters menu/parameter.It records the changes of parameters and remove from parameter.

DOWN: This button enables to fast progress between the values that are measured out of menu.Changes the value while inside the parameters in the menu.

RIGHT: This button allows to progress by displaying the measured values outside the menu together with the details. It allows navigation between parameters when pressed in menu. In the parameter,it allows to transition between steps and parameters.

General Description

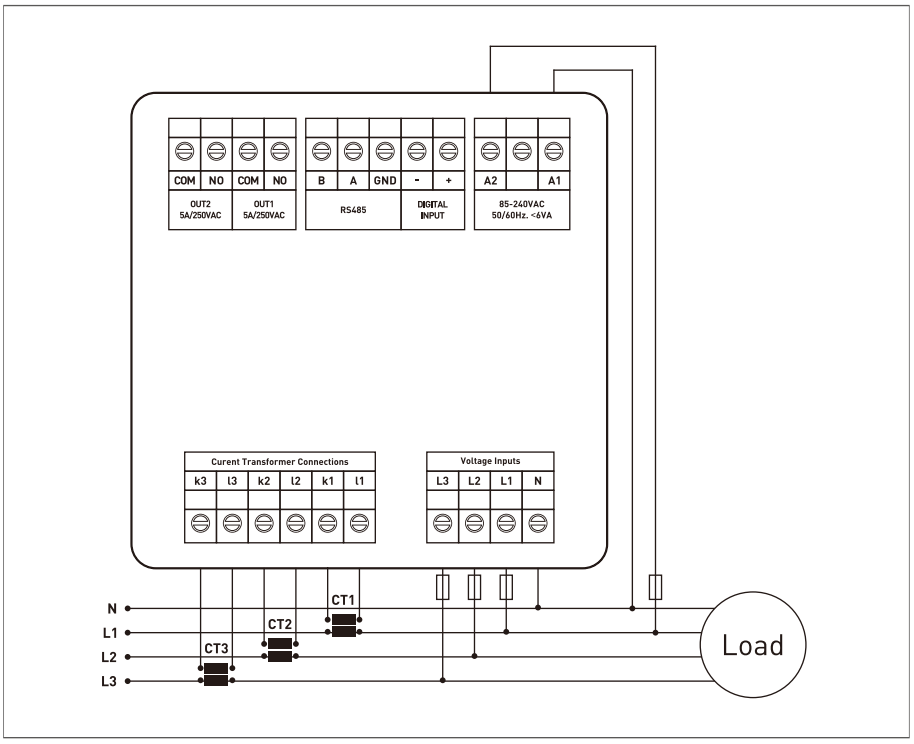
TPM-01ESH Energy analyzers measures load or voltage, current, cosφ, active power, reactive power, minimum and maximum values of the load and also measures demands.

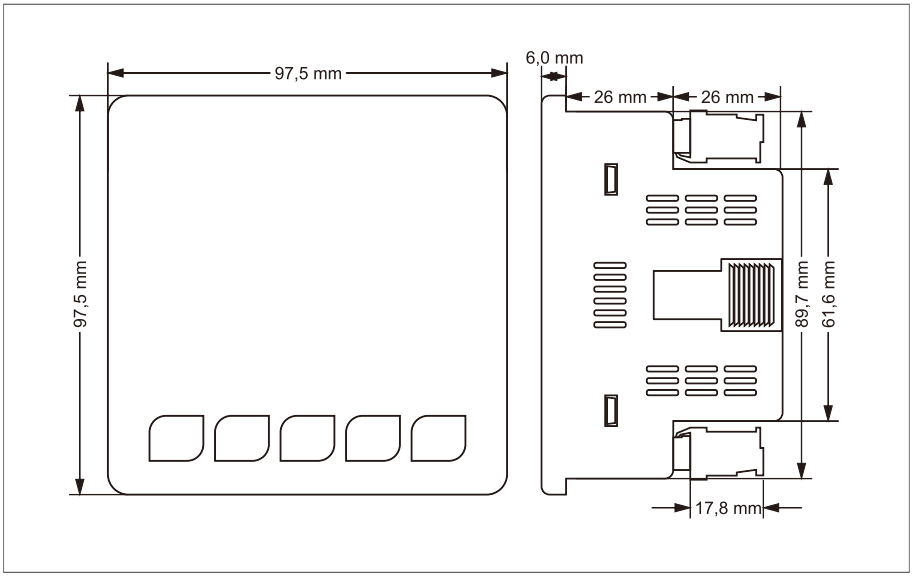
Features

- Easy Installation and Operation with 4×4 Digit Display
- With 3-Phase Voltage and 3-Phase Current Transformers
- Easy-To-Use Menu
- Remote Communication with RS485 (RS485 ModBus RTU)
- It Shows Per-Phase Active Powers (P)
- It Shows Per-Phase Total Reactive Powers (Q, ΣQ Inductive and Capacitive)
- It Shows Per-Phase Apparent Powers (S)
- It Shows Cosφ and Power Factor Values of Each Phase
- It Shows Voltage (V) and Current (I) Values of Each Phase
- It Shows Total Import and Export Active Energy (ΣkWh) Values
- It Shows Total Inductive and Capacitive Reactive Energy (ΣkVArh) Values
- It Shows the Minimum and Maximum Values
- It Shows Demand Values
- Can Reset the Energy Values
- Password Protected Menu
- 2 Relay Output (Adjustable)
- Event Records (High/Low Voltage/Current, Voltage/Current Imbalance, THD-I)

Specifications

Operating Voltage(Un)	85V ~ 240V AC
Operating Frequency	50/60Hz.
Operating Power	<10VA
Operating Temperature	-20°C ~ 55°C
Voltage Input	5V ~ 330V AC
Voltage Meas. Range	5V ~ 330kV
Current Meas. Range	1 ~ 63A(60D),10 ~ 100A(100D), 10 ~ 250A(250D)
Voltage, Current Accuracy	%±0.5
Active Accuracy	%±1
Reactive Accuracy	%±2
Supported Connection	3P4W
Voltage Transformer Ratio	1,0....999,9
Communication	RS485 MODBUS RTU
Baudrate	1200bps ~ 38400bps
Stop Bit	1 or 2
Parity	None, Even, Odd
Display	4x4 Digit 14mm LED Display 24xLEDs
Weigh	<400gr(60D); <520gr (100D); <560gr(250D).
Protection Class	IP41(Font Panel), IP20(Body)
Panel Hole Sizes	91mm x 91mm
Connection Type	Plug-in terminal connection
Cable Diameter	1.5mm².
Mounting	Mounting on panel front cover
Operating Altitude	<2000meters





Ordering

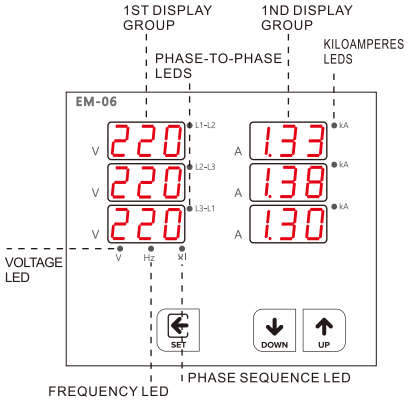
T P M - 0 1 E S H - 6 0 D

① ②

①	Type		
②	Current Range	60D	1 ~ 63A AC
		100D	10 ~ 100A AC
		250D	10 ~ 250A AC

EM-06

Multimeter (3P&4W)



General Description

EM Multimeter are designed to display three phase current, voltage and frequency.

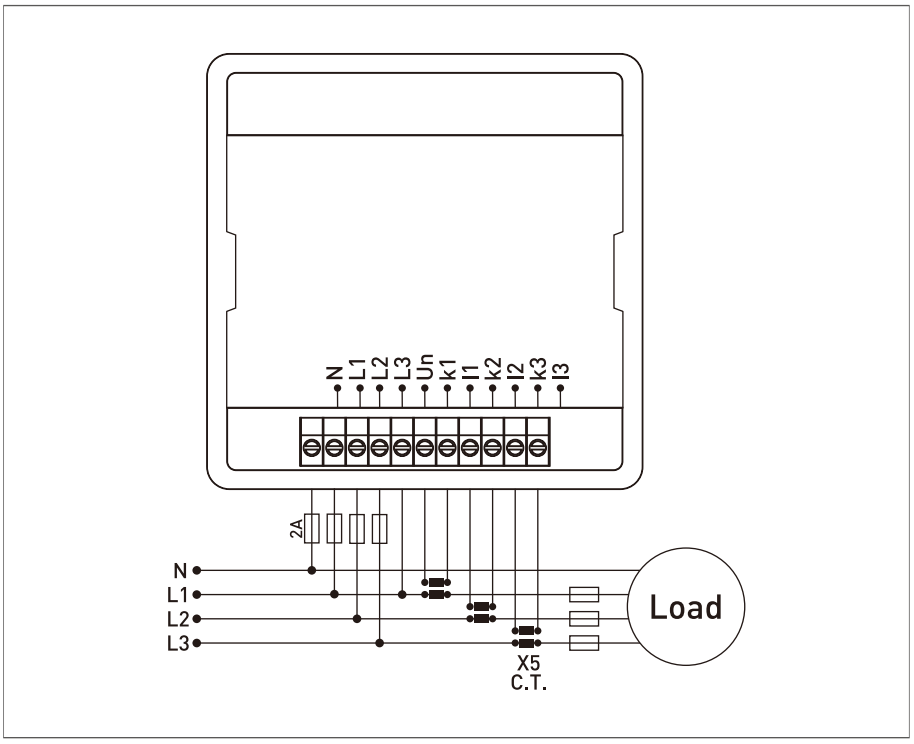
Measurement

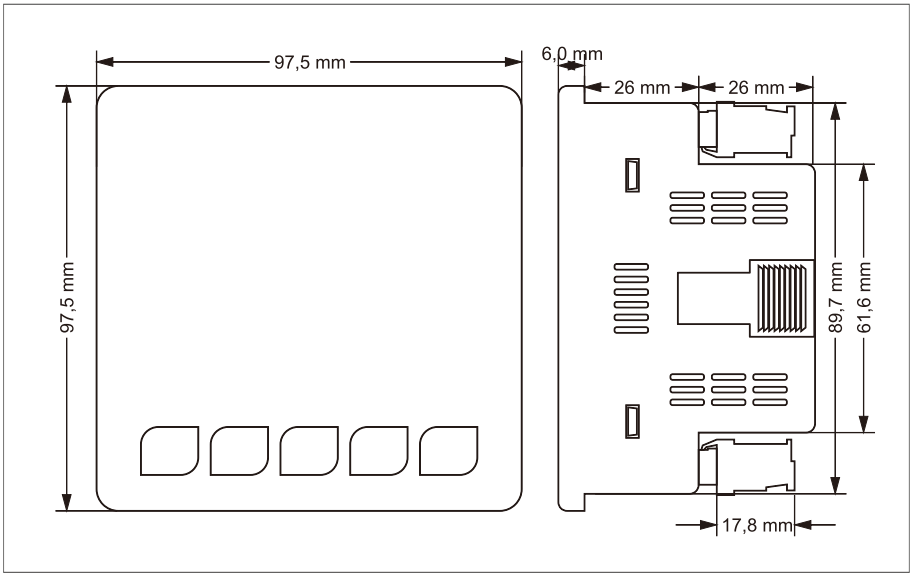
Measuring Range	
Current Measurement	10/5A ~ 9995/5A (...x5)
Voltage Measurement	1V ~ 500V AC
Frequency Measurement	1 ~ 400 Hz.

※ Phase Sequence: If the phase sequence is error can see the (X1) led gets on which take place in the 1st display group.

Specifications

Operating Voltage(Un)	85V ~ 240V AC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	0°C ~ 55°C
Current Measurement Range	70mA ~ 5,5A AC
Current Transformer	10/5A ~ 9995/5A (...x5)
Measurement Precision	±1%
Voltage Measurement Range	1V~ 500V AC
Display	3 digit 6 x display and 9 x leds
Connection Type	Plug-in Terminal
Cable Diameter	1.5mm²
Weight	<270gr.
Panel Hole Sizes	91mm x 91mm
Mounting	Front panel mounted.
Protection Class	IP41
Operating Altitude	<2000 meter





Ordering

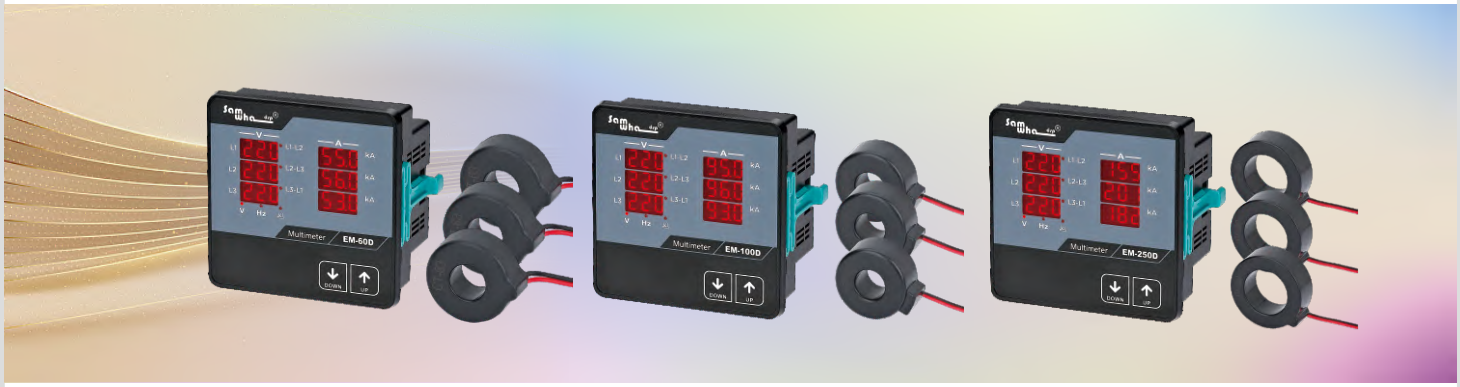
E M - 0 6

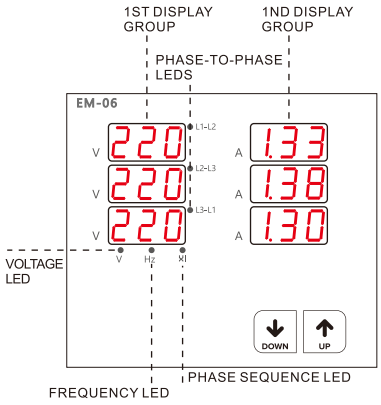
①

①	Type	

EM-60D,EM-100D,EM-250D

Multimeter (3P&4W) (Included C.T)





General Description

EM Multimeter are designed to display three phase current, voltage and frequency.

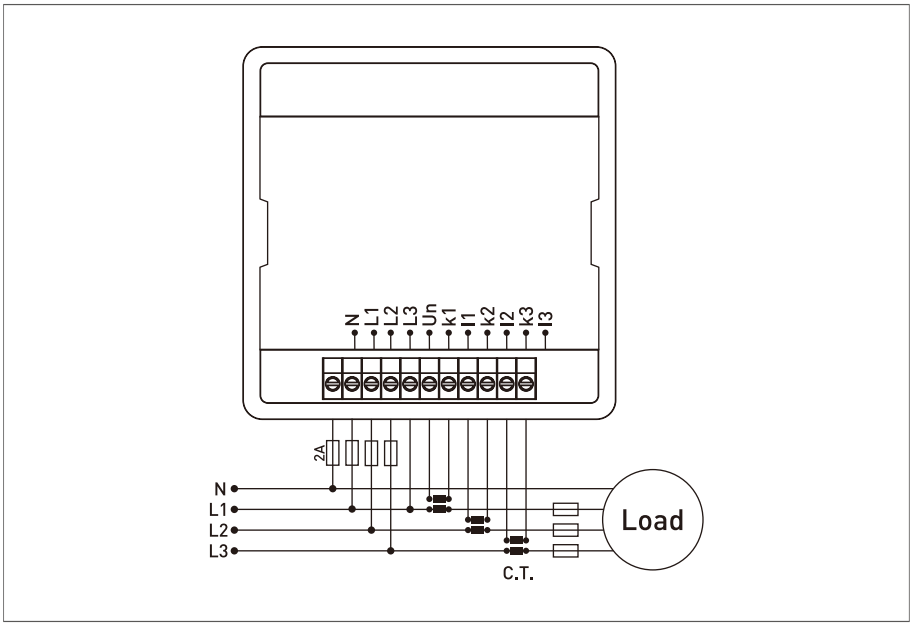
Measurement

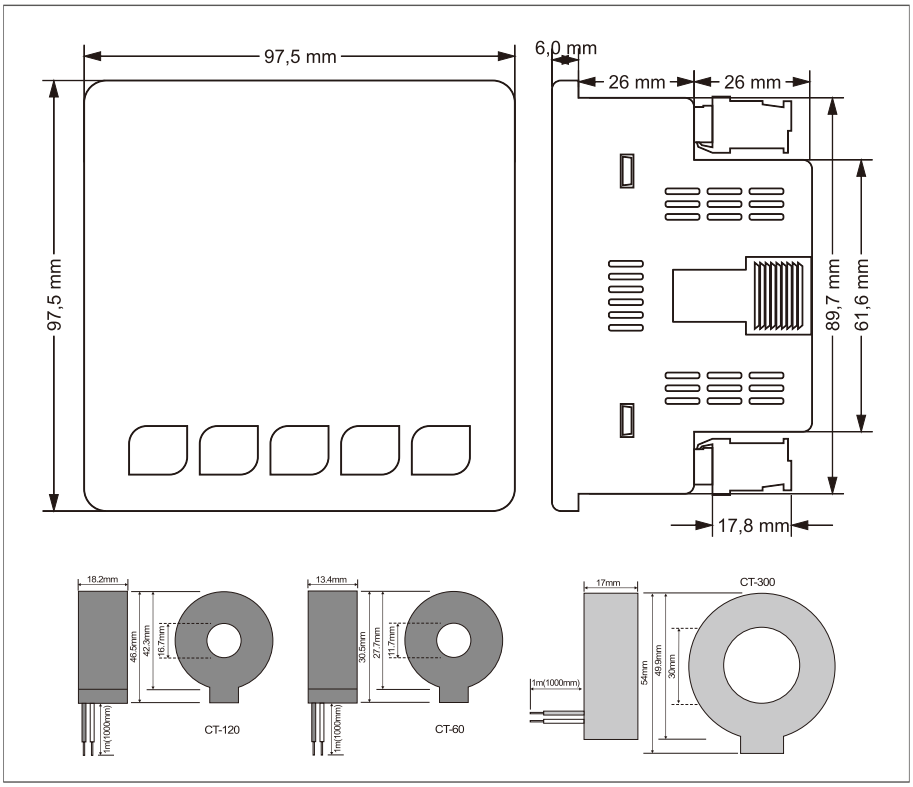
Measuring Range	EM-60D	EM-100D	EM-250D
Current Measurement	1 ~ 63A	10 ~ 100A	10 ~ 250A
Voltage Measurement	1V ~ 500V AC		
Frequency Measurement	1 ~ 400 Hz.		

※ Phase Sequence: If the phase sequence is error can see the (X1) led gets on which take place in the 1st display group.

Specifications

Operating Voltage(Un)	85 ~ 240V AC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	0°C ~ 55°C
Current Measurement Range	70mA ~ 5,5A AC
Current Transformer	1 ~ 63A(EM-60D), 10 ~ 100A(EM-100D), 10 ~ 250A(EM-250D)
Measurement Precision	±1%
Voltage Measurement Range	1V ~ 500V AC
Display	6 x 9mm 3 digit display and 6 x leds
Connection Type	Plug-in Terminal
Cable Diameter	1.5mm²
Weight	<340gr(60D); <460gr (100D); <530gr(250D)
Panel Hole Sizes	91mm x 91mm
Mounting	Front panel mounted.
Protection Class	IP41
Operating Altitude	<2000 meter





Ordering

E M - 6 0 D

① ②

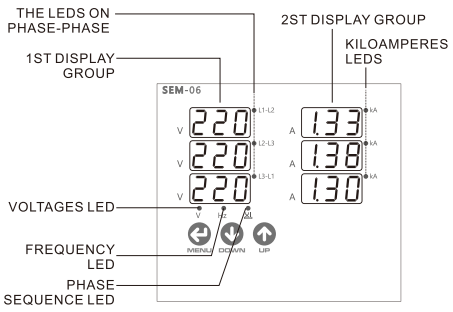
①	Type		
②	Model	60D	1 ~ 63A
		100D	10 ~ 100A
		250D	10 ~ 250A

SEM-06

Multimeter (3P&4W)

General Description

SEM Multimeter are designed to display three phase current, voltage and frequency.



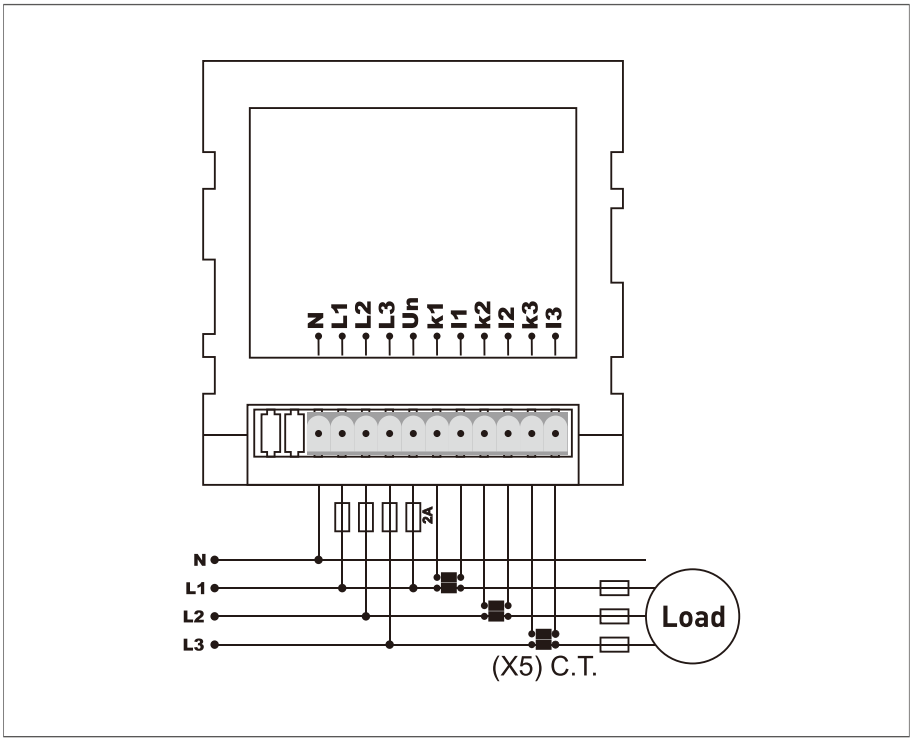
Measurement

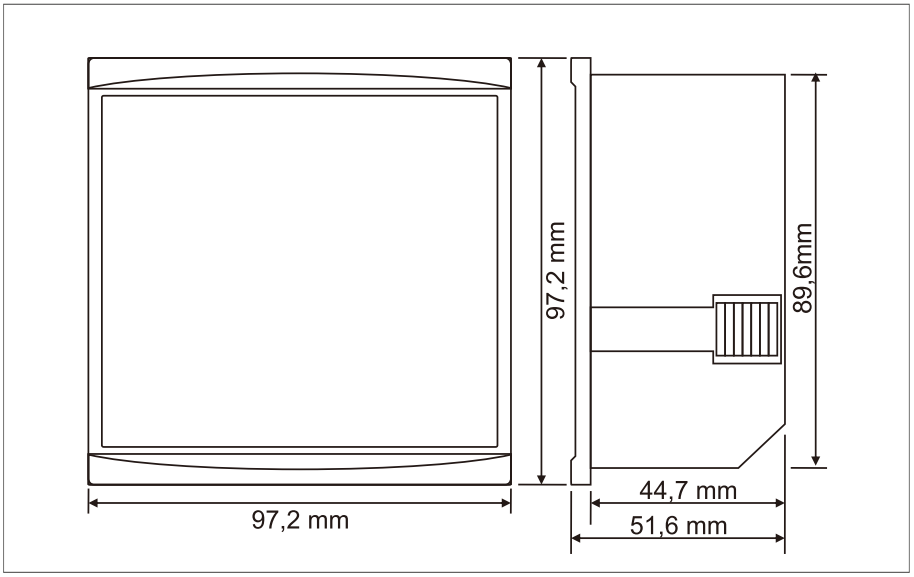
Measuring Range	
Current Measurement	10/5A ~ 9995/5A (...x5)
Voltage Measurement	1V ~ 500V AC
Frequency Measurement	1 ~ 400 Hz.

※ Phase Sequence: If the phase sequence is error can see the (X1) led gets on which take place in the 1st display group.

Specifications

Operating Voltage(Un)	140V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	0°C ~ 55°C
Current Measurement Range	70mA ~ 5,5A AC
Current Transformer	10/5A ~ 9995/5A (...x5)
Measurement Precision	±1%
Voltage Measurement Range	1V ~ 500V AC
Display	6 x 9mm 3 digit display and 9 x leds
Connection Type	Plug-in Terminal
Cable Diameter	1.5mm²
Weight	<370gr.
Panel Hole Sizes	91mm x 91mm
Mounting	Front panel mounted.
Protection Class	IP41
Operating Altitude	<2000 meter





Ordering

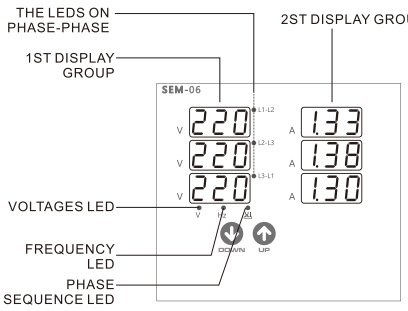
S E M - 0 6 - 1 1 0

① ②

①	Type		
②	Operating Voltage(Un)	110	110VAC
		220	150 ~ 270VAC (Can be omitted)

SEM-60D,SEM-100D,SEM-250D

Multimeter (3P&4W) (Included C.T)



General Description

SEM Multimeter are designed to display three phase current, voltage and frequency.

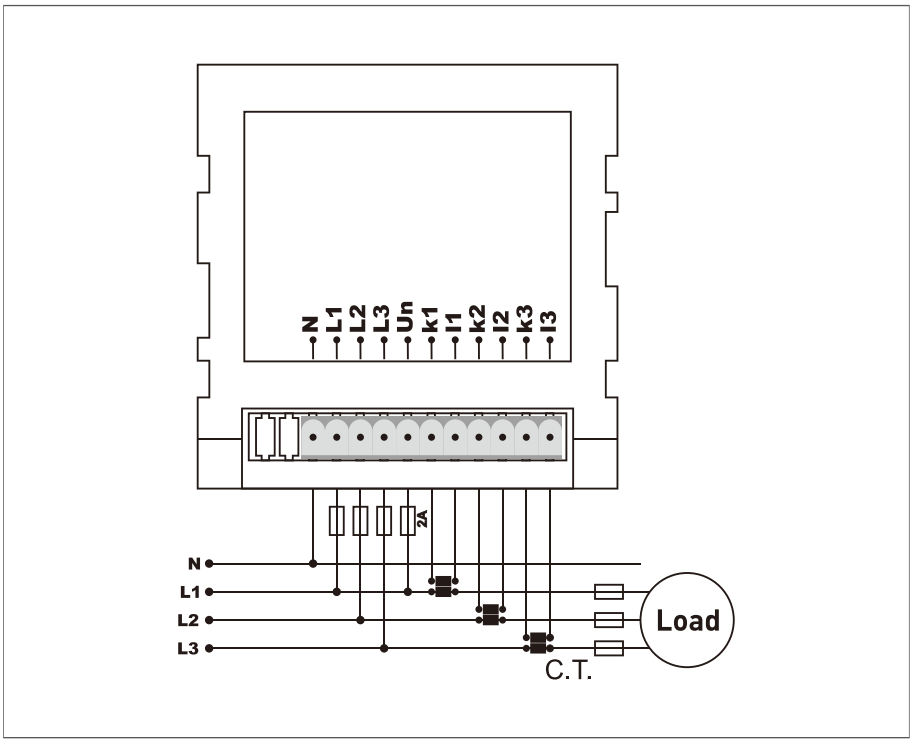
Measurement

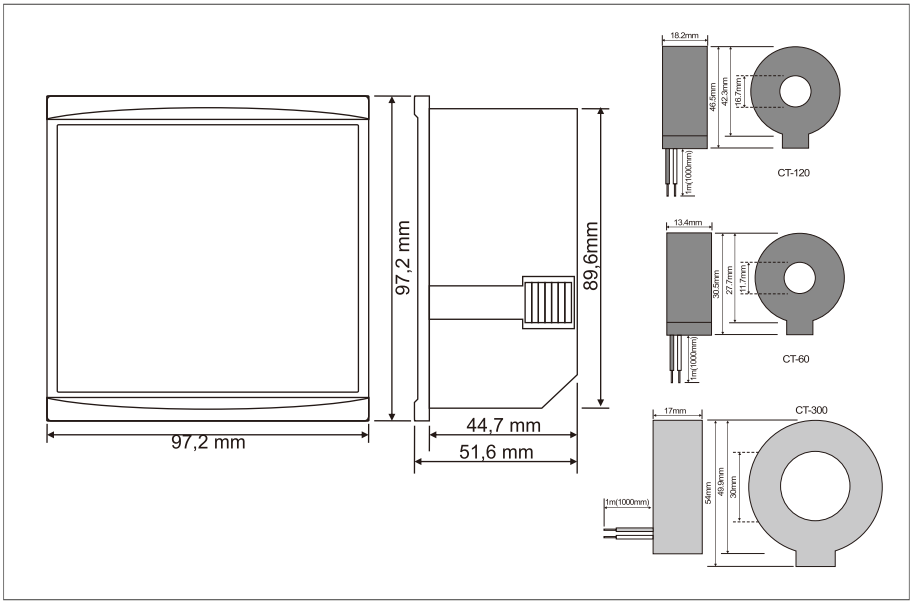
Measuring Range	SEM-60D	SEM-100D	SEM-250D
Current Measurement	1 ~ 63A	10 ~ 100A	10 ~ 250A
Voltage Measurement	1 ~ 500V AC		
Frequency Measurement	1 ~ 400 Hz.		

※ Phase Sequence: If the phase sequence is error can see the (X1) led gets on which take place in the 1st display group.

Specifications

Operating Voltage(Un)	140V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	0°C ~ 55°C
Current Transformer	1 ~ 63A(SEM-60D), 10 ~ 100A(SEM-100D), 10 ~ 250A(SEM-250D)
Measurement Precision	±1%
Voltage Measurement Range	1V ~ 500V AC
Display	6 x 9mm 3 digit display and 6 x leds
Connection Type	Plug-in Terminal
Cable Diameter	1.5mm²
Weight	<320gr(60D); <440gr (100D); <480gr(250D)
Panel Hole Sizes	91mm x 91mm
Mounting	Front panel mounted.
Protection Class	IP41
Operating Altitude	<2000 meter





Ordering

S	E	M	-	6	0	D	-	1	1	0
		①			②				③	

①	Type		
②	Model	60D	1 ~ 63A
		100D	10 ~ 100A
		250D	10 ~ 250A
③	Operating Voltage(Un)	110	110VAC
		220	150 ~ 270VAC (Can be omitted)

SDM-AVF96

Multimeter

General Description

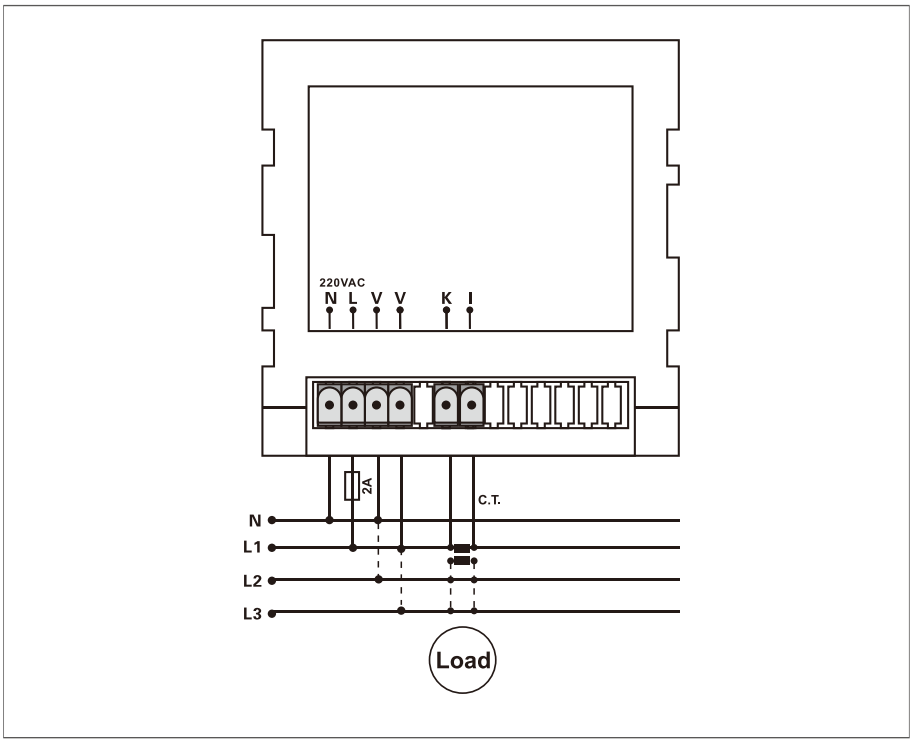
Multimeter are designed to display single phase current, voltage and frequency.

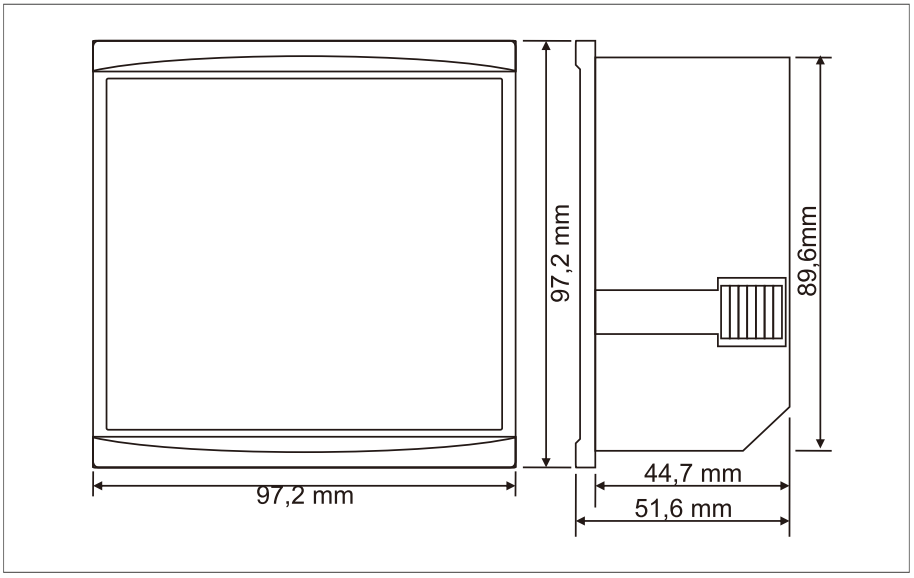
Measurement

Measuring Range	
Current Meas. Range	100mA ~ 5.5A; 10/5A ~ 9995/5A (...x5)
Voltage Meas. Range	10 ~ 500V AC
Frequency Meas. Range	1 ~ 400Hz

Specifications

Operating Voltage(Un)	150V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<4VA
Operating Temperature	-20°C ~ 55°C
Current Measurement Range	100mA ~ 5,5A AC
Current Transformer	10/5A ~ 9995/5A (...x5)
Measurement Precision	±1%
Display	3 x 3 digit 14mm Display 1 led
Connection Type	Plug-in Terminal
Cable Diameter	1.5mm²
Weight	<310gr.
Panel Hole Sizes	91x91mm
Mounting	Front panel mounted.
Protection Class	IP41
Operating Altitude	<2000 meter





Ordering

S	D	M	-	A	V	F	9	6	-	1	1	0
①										②		

①	Type		
②	Operating Voltage(Un)	110	110VAC
		220	150 ~ 270VAC (Can be omitted)

SDM-AVF96D / AVF109 / AVF209

Multimeter (Included C.T)

General Description

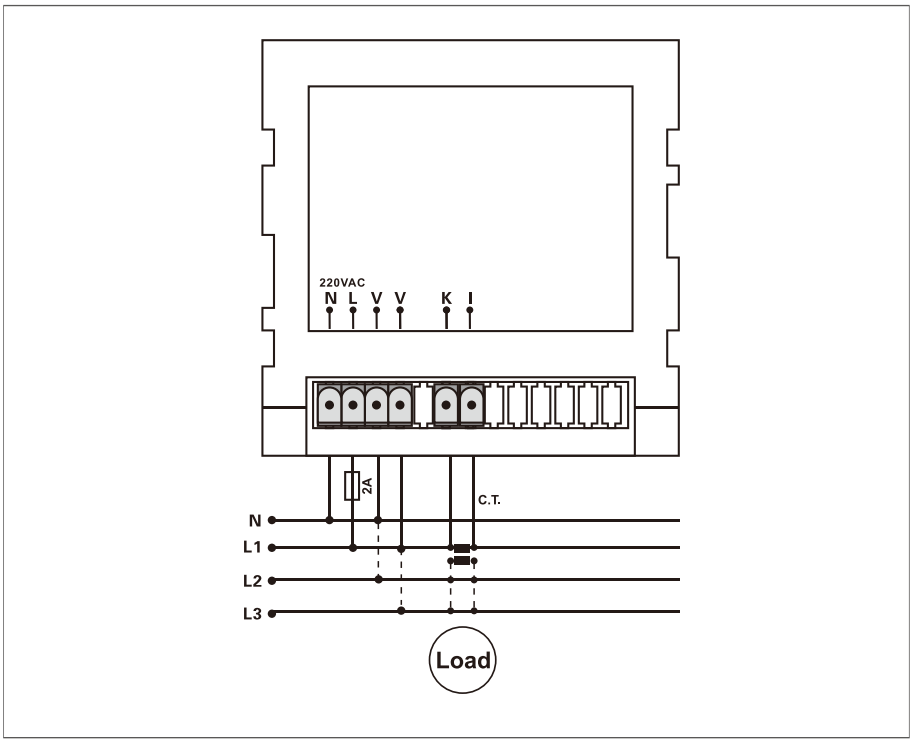
Multimeter are designed to display single phase current, voltage and frequency.

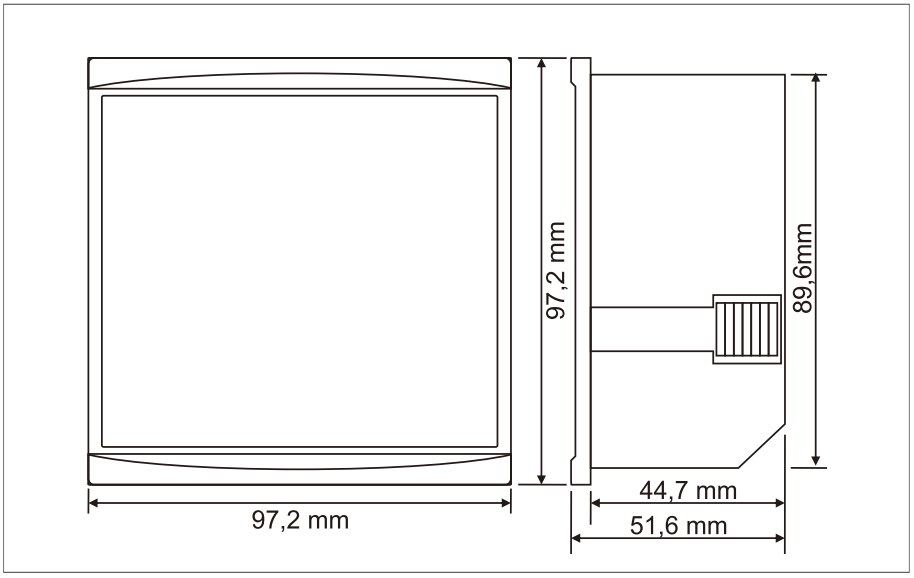
Measurement

Measuring Range	
Current Meas. Range	1 ~ 63A(AVF96D); 10 ~ 100A(AVF109); 10 ~ 250A(AVF209)
Voltage Meas. Range	10 ~ 500V AC
Frequency Meas. Range	1 ~ 400Hz

Specifications

Operating Voltage(Un)	150V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<4VA
Operating Temperature	-20°C ~ 55°C
Current Transformer	1 ~ 63A(AVF96D); 10 ~ 100A(AVF109); 10 ~ 250A(AVF209)
Measurement Precision	±1%
Display	3 x 3 digit 14mm Display
Connection Type	Plug-in Terminal
Cable Diameter	1.5mm²
Weight	<340gr.(AVF96D); <375gr.(AVF109); <390gr.(AVF209)
Panel Hole Sizes	91x91mm
Mounting	Front panel mounted.
Protection Class	IP41
Operating Altitude	<2000 meter





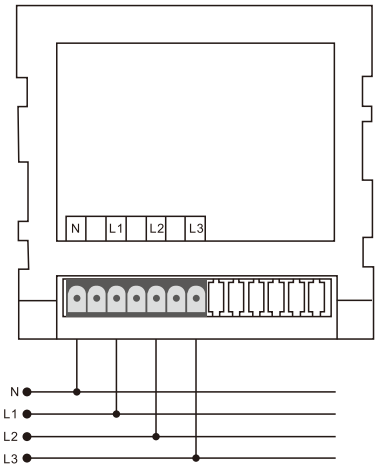
Ordering

S	D	M	-	A	V	F	9	6	D	-	1	1	0
①							②				③		

①	Type		
②	Current Meas. Range	96D	1 ~ 63A
		109	10 ~ 100A
		209	10 ~ 250A
③	Operating Voltage(Un)	110	110VAC
		220	150 ~ 270VAC (Can be omitted)

SDM-V96T

Three Phase Voltmeter (3P&4W)



General Description

Designed to monitoriza voltage between phase-neutral and phase-phase.The device also shows phase sequence.

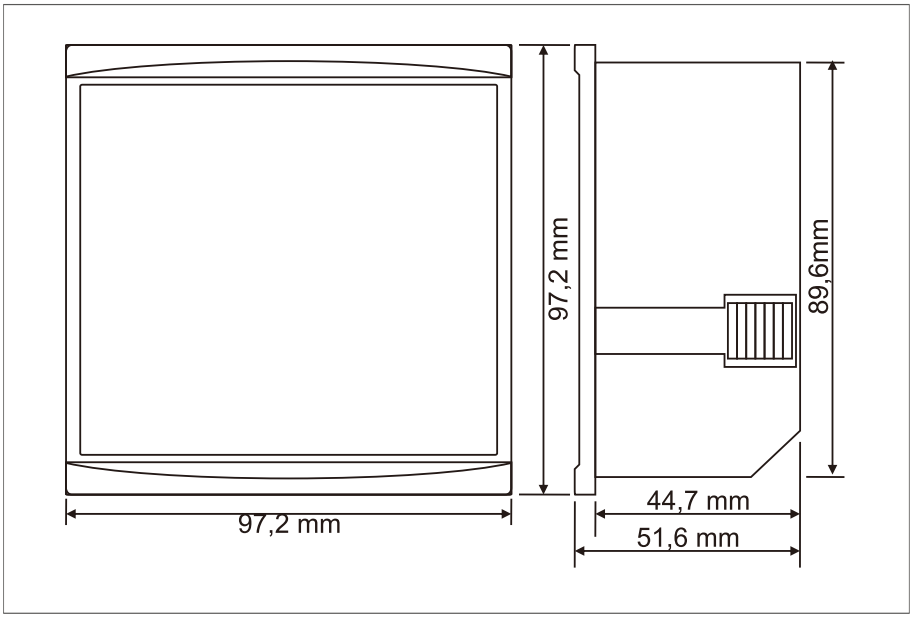
Measurement

Measuring Range	
L - N	5 ~ 300V AC
L - L	5 ~ 500V AC

※ If the phase sequence is correct, L1,L2,L3 will be written from top to bottom in the display.
If the phase sequence is reversed,L1,L3,L2 will be written from top to bottom in the display.

Specifications

Operating Voltage(Un)	150V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<4VA
Operating Temperature	0°C ~ 55°C
Meas. Range(L-N)	5 ~ 300V AC (The voltage in L1 must be at least 140V)
Meas. Range(L-L)	5 ~ 500V AC
Measurement Precision	±%1
Voltage Measurement Range	5V ~ 500V AC
Display	3x3 digit 14mm
Connection Type	Plug-in Terminal
Cable Diameter	1.5mm²
Weight	<350gr.
Panel Hole Sizes	91mm x 91mm
Mounting	Front panel mounted.
Operating Altitude	<2000 meter



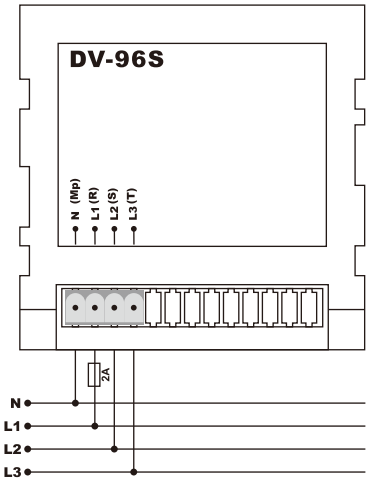
Ordering

S	D	M	-	V	9	6	T
①				②			

①	Type		
②	Operating Voltage(Un)	110	110VAC
		220	150 ~ 270VAC (Can be omitted)

SDM-V96S, SDM-V72S

Three Phase Voltmeter (3P&4W)



General Description

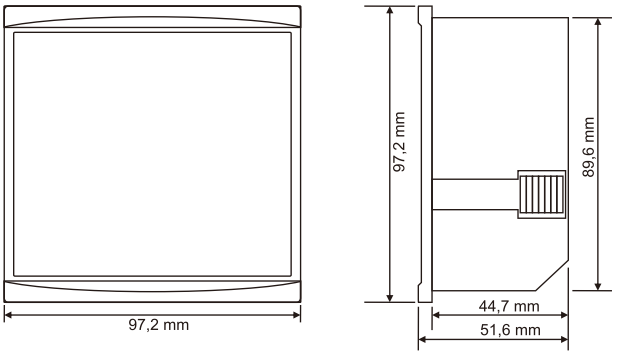
Voltmeter is designed to watch voltage between phase-neutral and phase-phase.

Measurement

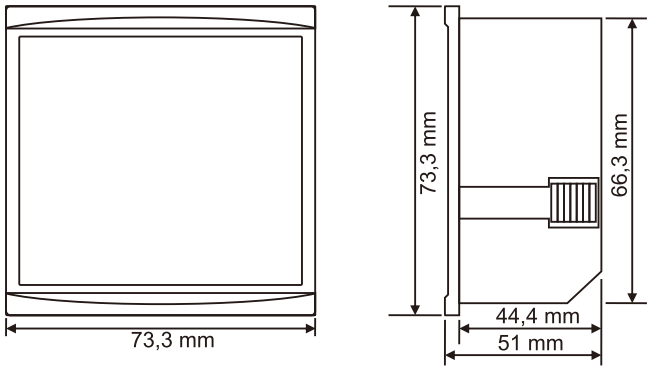
Measuring Range	
Voltage Meas.Range	10 ~ 500V AC

Specifications

Operating Voltage(Un)	140V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	-20°C ~ 55°C
Meas. Range	10 ~ 500V AC
Measurement Precision	±1%
Display	20mm(96x96),14mm(72x72)
Connection Type	Plug-in Terminal
Cable Diameter	1.5mm²
Weight	<300gr.
Panel Hole Sizes	91x91mm(96),68x68mm(72)
Mounting	Front panel mounted.
Protection Class	IP41
Operating Altitude	<2000 meter



Dimensions for SDM-V96S



Dimensions for SDM-V72S

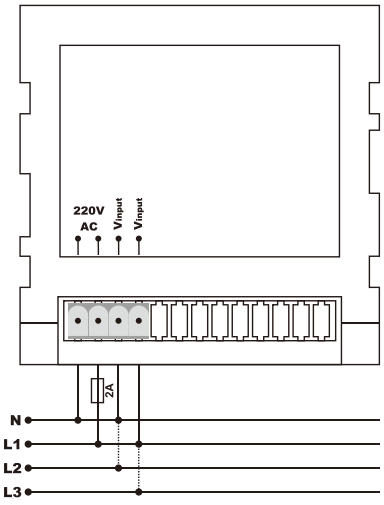
Ordering

S	D	M	-	V	9	6	S	-	1	1	0
①				②					③		

①	Type		
②	Voltmeter Size	V96S	96x96
		V72S	72x72
③	Operating Voltage(Un)	110	110VAC
		220	150 ~ 270VAC (Can be omitted)

SDM-V96 / V72 / V48 / V36

Voltmeter (3P&4W)



General Description

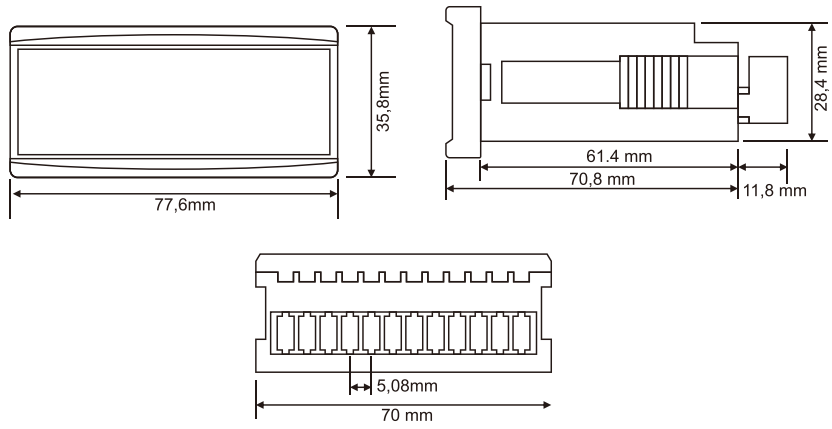
Voltmeter is designed to watch voltage between phase-neutral and phase-phase.

Measurement

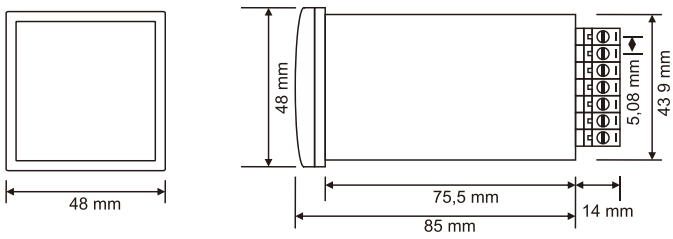
Measuring Range	
Voltage Meas.Range	10 ~ 500V AC

Specifications

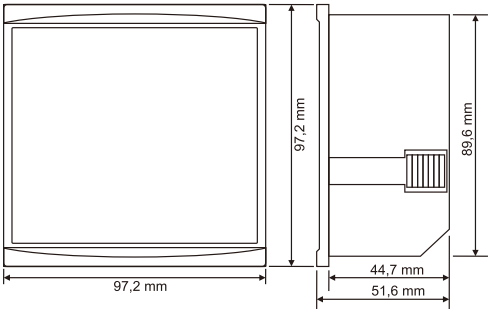
Operating Voltage(Un)	140V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	-20°C ~ 55°C
Meas. Range	10 ~ 500V AC
Measurement Precision	±1%
Display	20mm(96),14mm(72,36),9mm(48) dissplay
Connection Type	Plug-in Terminal
Cable Diameter	1.5mm²
Weight	<300gr.
Panel Hole Sizes	91x91mm(96),68x68mm(72),46x46mm(48),31x72mm(36)
Mounting	Front panel mounted.
Protection Class	IP41
Operating Altitude	<2000 meter



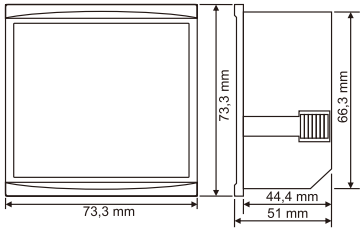
Dimensions for SDM-V36



Dimensions for SDM-V48



Dimensions for SDM-V96



Dimensions for SDM-V72

Ordering

S	D	M	-	V	9	6	-	1	1	0
①				②				③		

①	Type		
②	Voltmeter Size	V96	96x96
		V72	72x72
		V48	48x48
		V36	36x96
③	Operating Voltage(Un)	110	110VAC
		220	150 ~ 270VAC (Can be omitted)

DV-DIN

Voltmeter (3P&4W) (Din-rail Type)

General Description

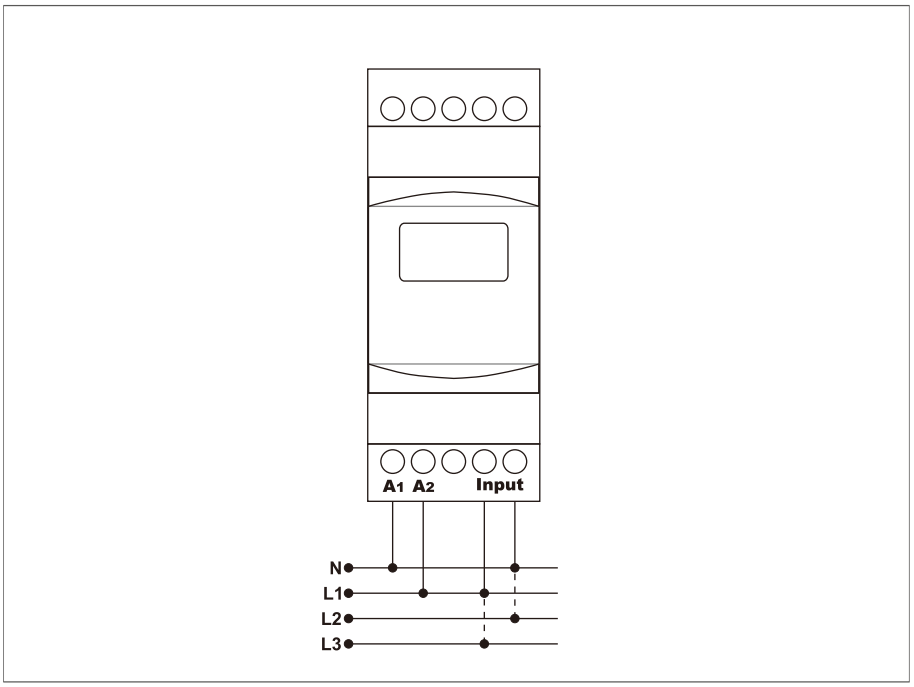
Voltmeter is designed to watch voltage between phase-neutral and phase-phase.

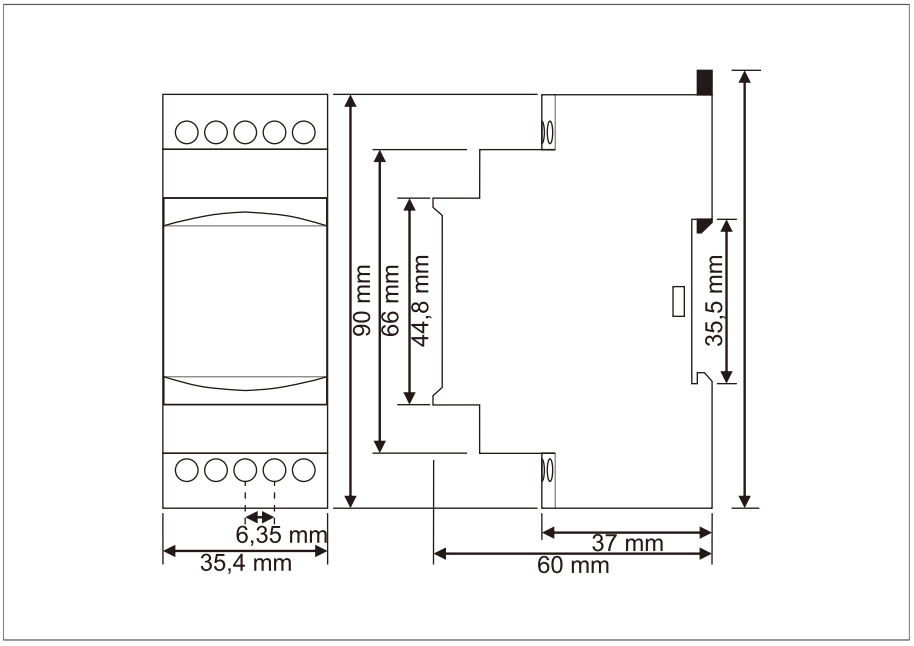
Measurement

Measuring Range	
Voltage Meas.Range	10 ~ 500V AC

Specifications

Operating Voltage(Un)	140V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	-20°C ~ 55°C
Meas. Range	10 ~ 500V AC
Measurement Precision	±1%
Display	9mm 3 digit
Connection Type	Terminal
Cable Diameter	1.5mm²
Weight	<200gr.
Mounting	Vertical assembled in the panel or assembled on the din rail.
Protection Class	IP41
Operating Altitude	<2000 meter





Ordering

D	V	-	D	I	N	-	1	1	0
①							②		

①	Type		
②	Operating Voltage(Un)	110	110VAC
		220	140 ~ 270VAC (Can be omitted)

SDM-A96T

Three Phase Ammeter

General Description

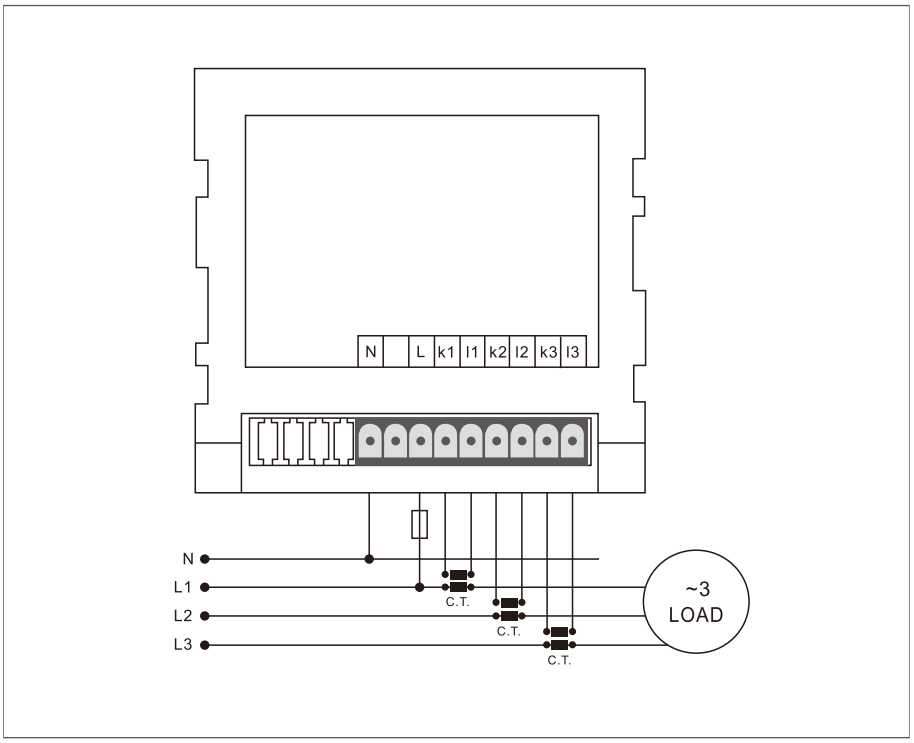
Digital three phase ammeters are designed to monitor the AC current value drawn by the loads continuously.

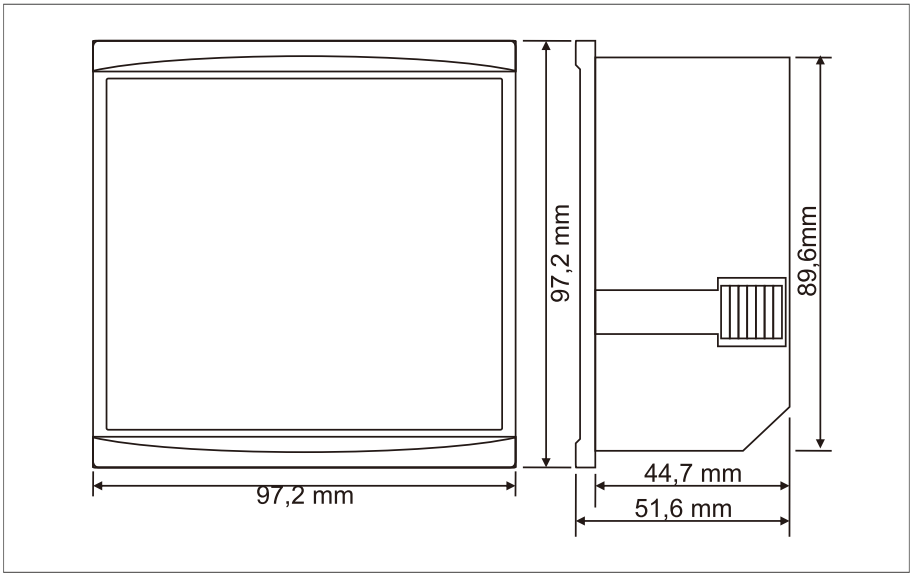
Measurement

Measuring Range	
Current Meas. Range	100mA ~ 5,5A AC; 10/5A ~ 9995/5A (...x5)

Specifications

Operating Voltage(Un)	150V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	-20°C ~ 55°C
Current Meas. Range	100mA ~ 5,5A AC
Current Transformer	10/5A ~ 9995/5A (...x5)
Measurement Precision	±%1
Display	3x4 digit 14mm display
Connection Type	Plug-in Terminal
Cable Diameter	1.5mm²
Weight	<350gr.
Panel Hole Sizes	91mm x 91mm
Mounting	Front panel mounted.
Protection Class	IP41
Operating Altitude	<2000 meter





Ordering

S D M - A 9 6 T

① ②

①	Type		
②	Operating Voltage(Un)	110	110VAC
		220	150 ~ 270VAC (Can be omitted)

SDM-A96TD, SDM-A109T, SDM-A209T

Three Phase Ammeter (Included C.T)

General Description

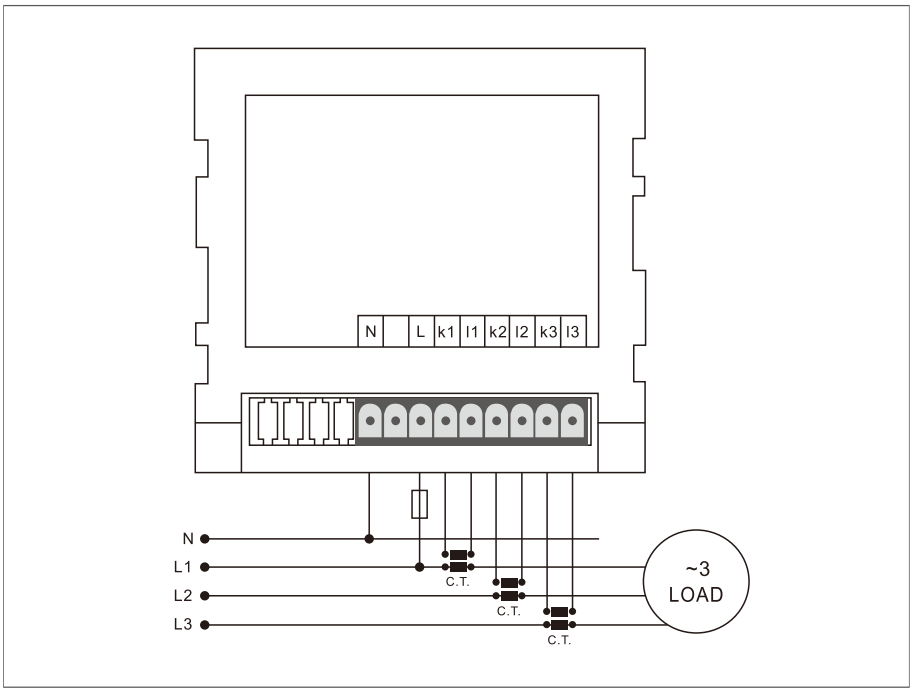
Digital three phase ammeter are designed to monitor the AC current value drawn by the loads continuously.

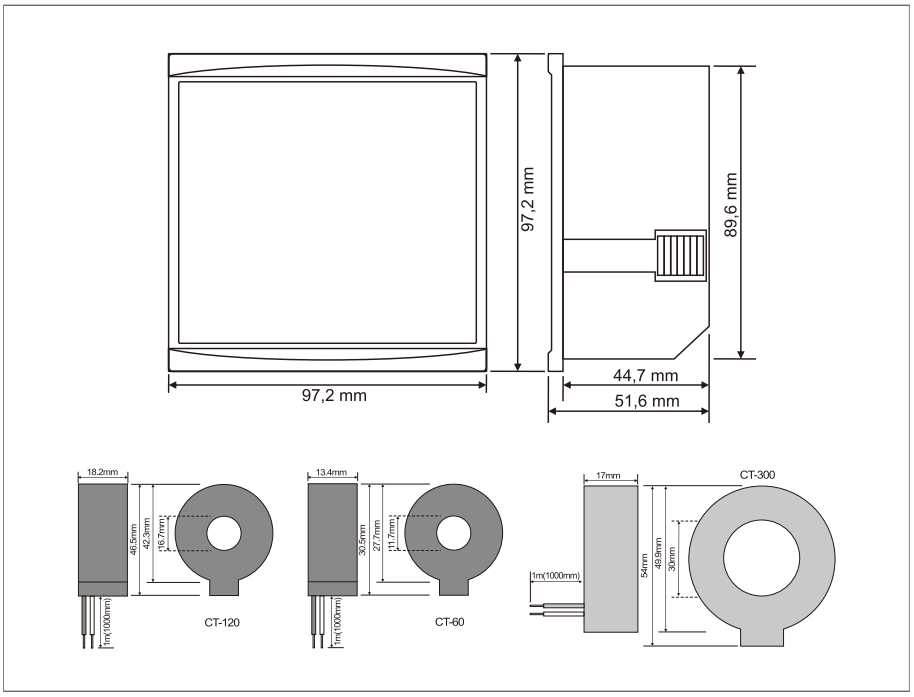
Measurement

Measuring Range	
Current Meas. Range	1 ~ 63A(A96TD); 10 ~ 100A(109T); 10 ~ 250A(209T)

Specifications

Operating Voltage(Un)	150V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	-20°C ~ 55°C
Current Transformer	1 ~ 63A(A96TD); 10 ~ 100A(109T); 10 ~ 250A(209T)
Measurement Precision	±%1
Display	3x4 digit 14mm display
Connection Type	Plug-in Terminal
Cable Diameter	1.5mm²
Weight	<390gr.(A96TD); <510gr.(109T); <550gr.(209T)
Panel Hole Sizes	91mm x 91mm
Mounting	Front panel mounted.
Protection Class	IP41
Operating Altitude	<2000 meter





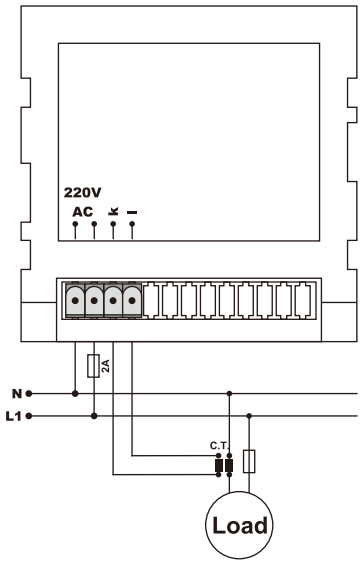
Ordering

S	D	M	-	A	9	6	T	D	-	1	1	0
	①					②					③	

①	Type		
②	Current Meas. Range	A96TD	1 ~ 63A
		A109T	10 ~ 100A
		A209T	10 ~ 250A
③	Operating Voltage(Un)	110	110VAC
		220	150 ~ 270VAC (Can be omitted)

SDM-A96, SDM-A72, SDM-A48, SDM-A36

Ammeter



General Description

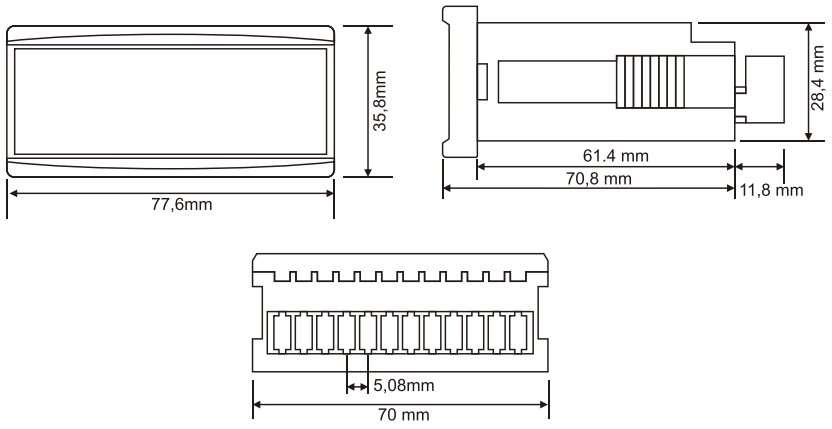
Digital ammeter are designed to monitor the AC current value drawn by the loads continuously.

Measurement

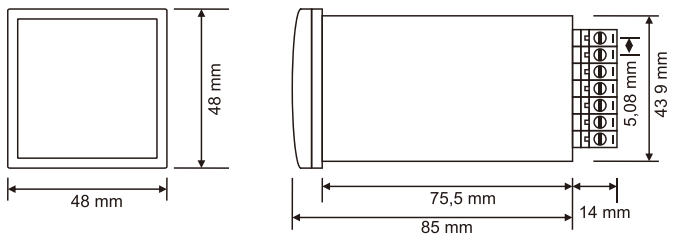
Measuring Range	
Current Meas. Range	100mA ~ 5,5A AC; 10/5A ~ 9995/5A (...x5)

Specifications

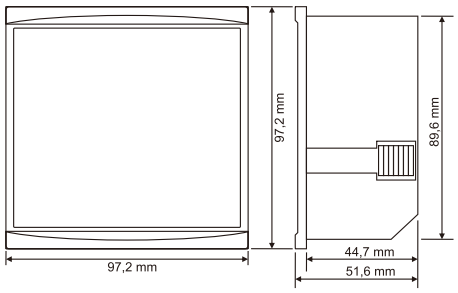
Operating Voltage(Un)	150V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	-20°C ~ 55°C
Current Meas. Range	100mA ~ 5,5A AC
Current Transformer	10/5A ~ 9995/5A (...x5)
Measurement Precision	±%1
Display	20mm(96),14mm(72),9mm(36 and 48) display
Connection Type	Plug-in Terminal
Cable Diameter	1.5mm²
Weight	<300gr.
Panel Hole Sizes	91x91mm(96),68x68mm(72),46x46mm(48),31x72mm(36)
Mounting	Front panel mounted.
Protection Class	IP41
Operating Altitude	<2000 meter



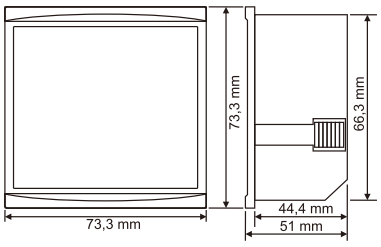
Dimensions for SDM-A36



Dimensions for SDM-A48



Dimensions for SDM-A96



Dimensions for SDM-A72

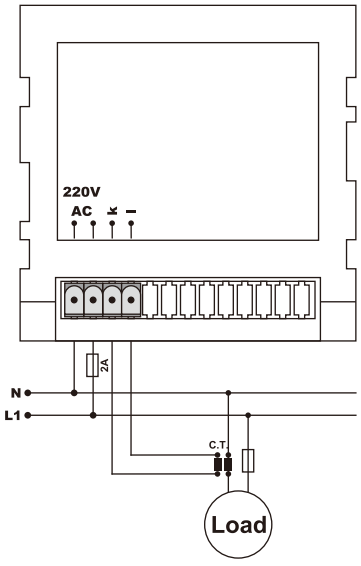
Ordering

S	D	M	-	A	9	6	-	1	1	0
①				②				③		

①	Type		
②	Ammeter Size	A96	96x96
		A72	72x72
		A48	48x48
		A36	36x96
③	Operating Voltage(Un)	110	110VAC
		220	150 ~ 270VAC (Can be omitted)

SDM-A96D / A72D / A48D / A36D / A109 / A107 / A104 / A103 / A209 / A207 / A204 / A203

Ammeter (Included C.T)



General Description

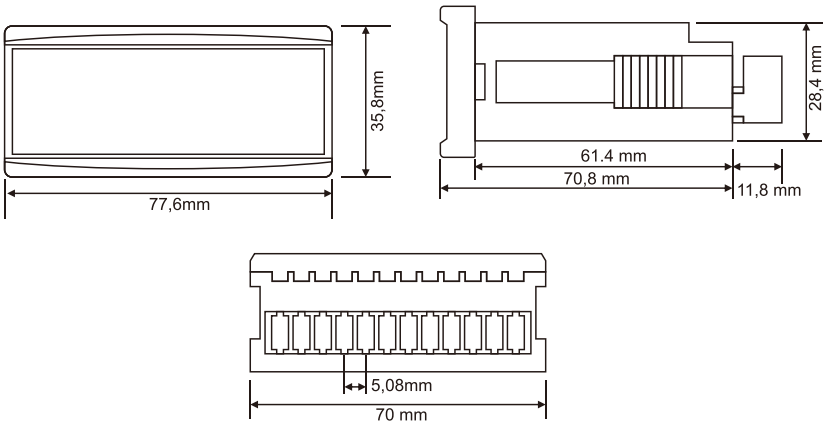
Digital ammeter are designed to monitor the AC current value drawn by the loads continuously.

Measurement

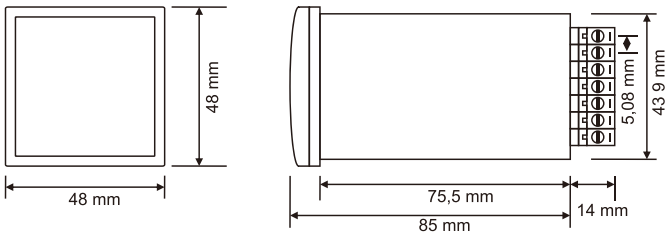
Measuring Range	
Current Meas. Range	1 ~ 63A(96D,72D,48D,36D); 10 ~ 100A(109,107,104,103); 10 ~ 250A(209,207,204,203)

Specifications

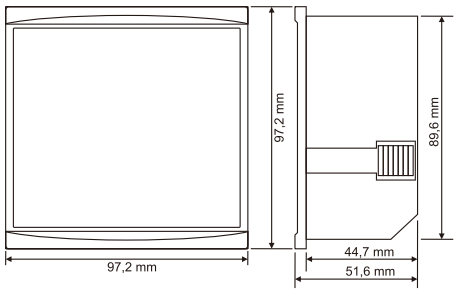
Operating Voltage(Un)	150V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	-20°C ~ 55°C
Current Transformer	1 ~ 63A(96D,72D,48D,36D); 10 ~ 100A(109,107,104,103); 10 ~ 250A(209,207,204,203)
Measurement Precision	±%1
Display	20mm(96),14mm(72),9mm(36 and 48) display
Connection Type	Plug-in Terminal
Cable Diameter	1.5mm²
Weight	<330gr.(1 ~ 63A); <370gr.(10 ~ 100A); <380gr.(10 ~ 250A)
Panel Hole Sizes	91x91mm(96),68x68mm(72),46x46mm(48),31x72mm(36)
Mounting	Front panel mounted.
Protection Class	IP41
Operating Altitude	<2000 meter



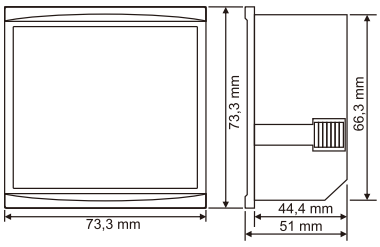
Dimensions for SDM-A36



Dimensions for SDM-A48



Dimensions for SDM-A96



Dimensions for SDM-A72

Ordering

S	D	M	-	A	9	6	-	1	1	0
	①				②				③	

①	Type						
②	Ammeter Size	A96D	96x96 (1 ~ 63A)	A109	96x96 (10 ~ 100A)	A209	96x96 (10 ~ 250A)
		A72D	72x72 (1 ~ 63A)	A107	72x72 (10 ~ 100A)	A207	72x72 (10 ~ 250A)
		A48D	48x48 (1 ~ 63A)	A104	48x48 (10 ~ 100A)	A204	48x48 (10 ~ 250A)
		A36D	36x96 (1 ~ 63A)	A103	36x96 (10 ~ 100A)	A203	36x96 (10 ~ 250A)
③	Operating Voltage(Un)	110	110VAC				
		220	150 ~ 270VAC (Can be omitted)				

DA-XXX

Ammeter (Din-rail Type)

General Description

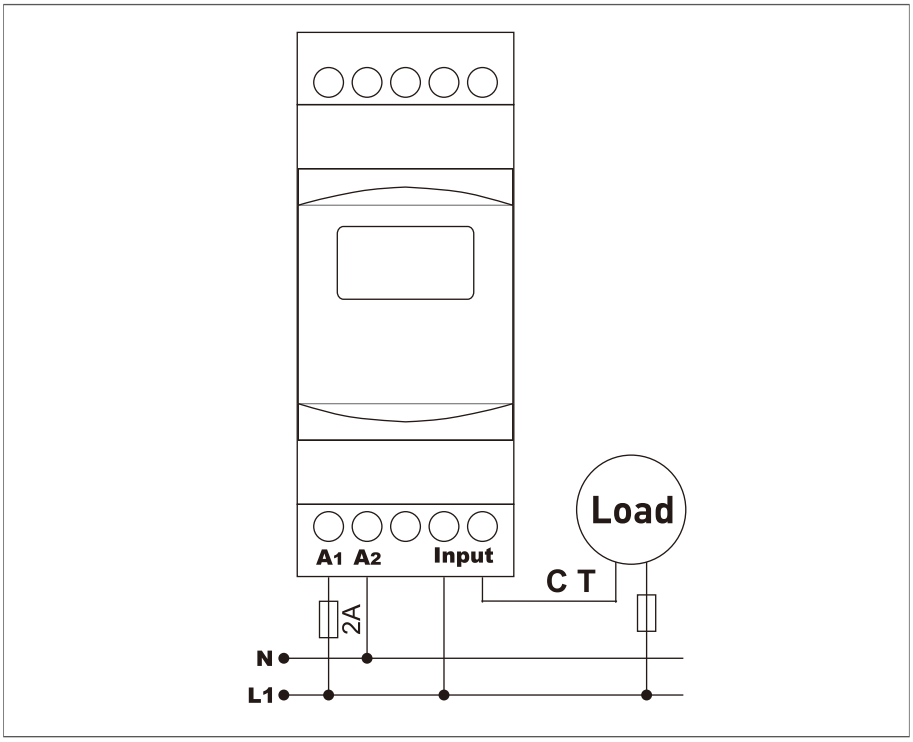
Digital ammeter are designed to monitor the AC current value drawn by the loads continuously.

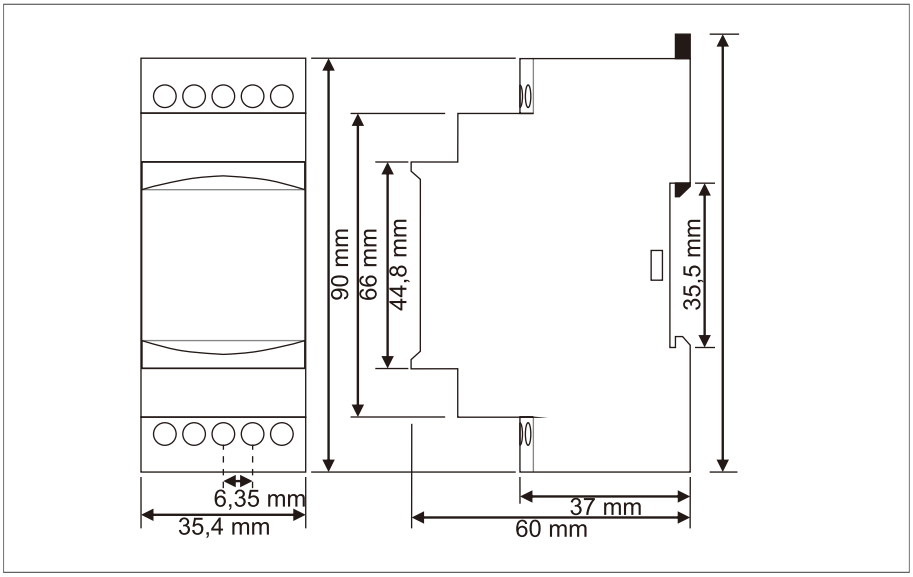
Measurement

Measuring Range	
Current Meas. Range	100mA ~ 995/5A (...x5)

Specifications

Operating Voltage(Un)	150V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<3VA
Operating Temperature	-20°C ~ 55°C
Current Meas. Range	100mA ~ 5,5A AC
Current Transformer	50/5A,75/5A,100/5A,150/5A,200/5A,250/5A,300/5A,400/5A, 500/5A,600/5A,800/5A,1000/5A
Measurement Precision	±%1
Display	1x3 Digit Display
Connection Type	Terminal
Cable Diameter	1.5mm²
Weight	<180gr.
Mounting	Vertical assembled in the panel or assembled on the din rail.
Protection Class	IP41
Operating Altitude	<2000 meter





Ordering

D	A	-	D	I	N	-	1	1	0
①			②				③		

①	Type				
②	Current Meas. Range	DIN	100mA ~ 5.5A	300/5	300A
		50/5	50A	400/5	400A
		75/5	75A	500/5	500A
		100/5	100A	600/5	600A
		200/5	200A	800/5	800A
		250/5	250A	1000/5	1000A
③	Operating Voltage(Un)	110	110VAC		
		220	150 ~ 270VAC (Can be omitted)		

※ Current transformer not included

DA-XXD

Ammeter (Din-rail Type) (Included C.T)

General Description

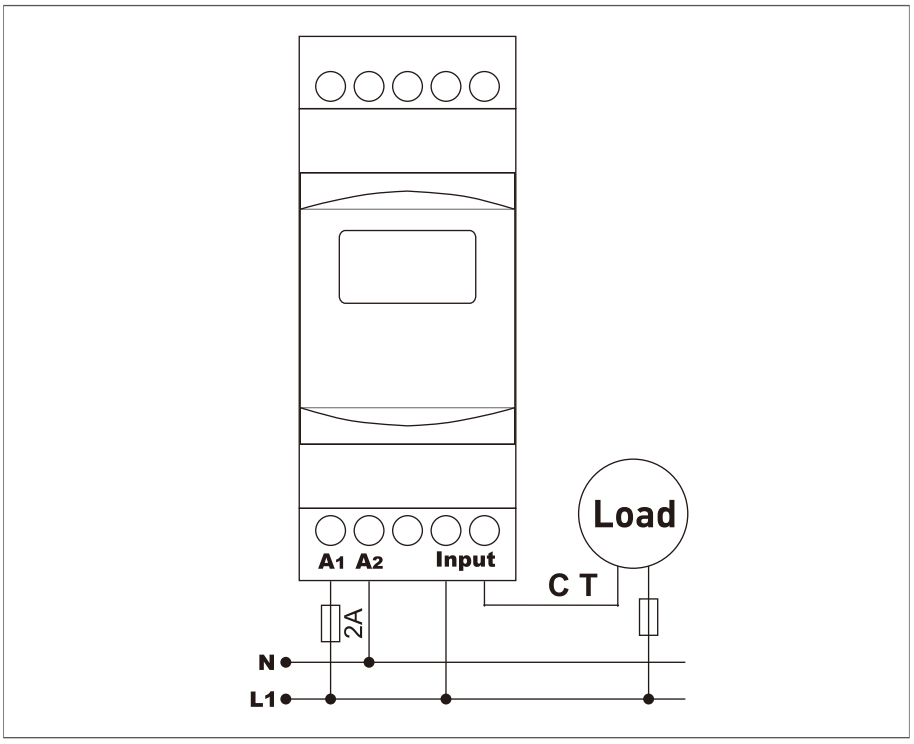
Digital ammeter are designed to monitor the AC current value drawn by the loads continuously.

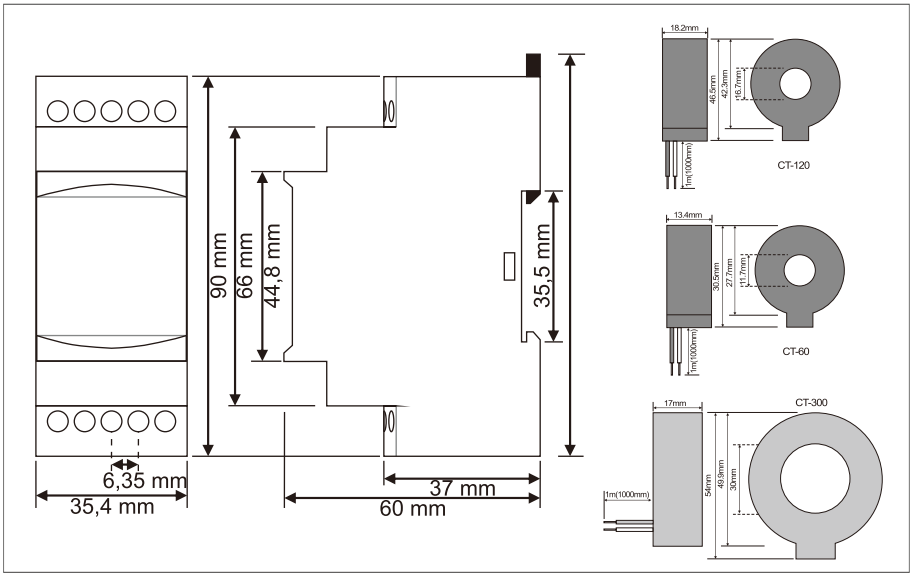
Measurement

Measuring Range	
Current Meas. Range	1 ~ 63A(60D); 10 ~ 100A(100D); 10 ~ 250A(250D)

Specifications

Operating Voltage(Un)	150V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<3VA
Operating Temperature	-20°C ~ 55°C
Current Transformer	1 ~ 63A(60D); 10 ~ 100A(100D); 10 ~ 250A(250D)
Measurement Precision	±%1
Display	1x3 Digit Display
Connection Type	Terminal
Cable Diameter	1.5mm²
Weight	<210gr.(DA-60D); <250gr.(DA-100D); <260gr.(DA-250D)
Mounting	Vertical assembled in the panel or assembled on the din rail.
Protection Class	IP41
Operating Altitude	<2000 meter





Ordering

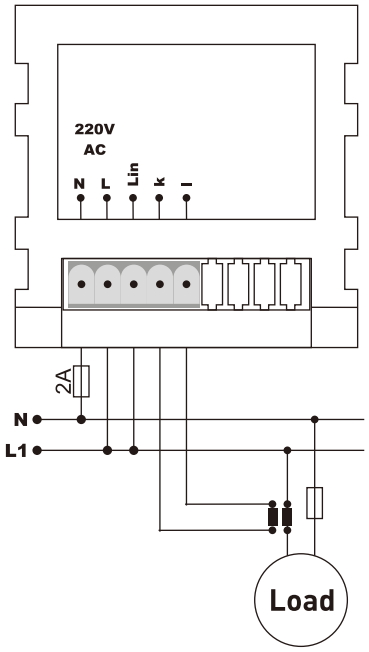
D A - 6 0 D - 1 1 0

① ② ③

①	Type		
②	Current Meas. Range	60D	1 ~ 63A
		100D	10 ~ 100A
		250D	10 ~ 250A
③	Operating Voltage(Un)	110	110VAC
		220	150 ~ 270VAC (Can be omitted)

DAV-96,DAV-72

Ammeter and Voltmeter



General Description

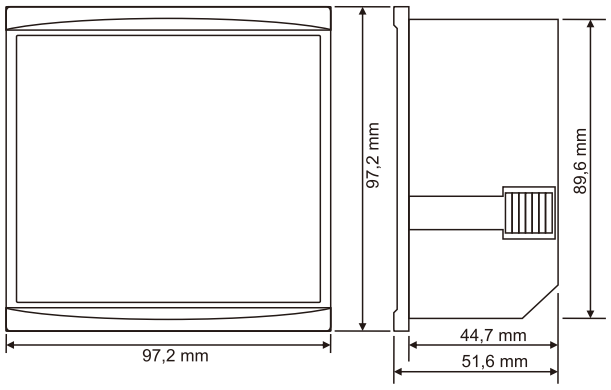
Digital voltmeter and ammeter are designed to monitor both AC current value drawn by the loads and the voltage value of the relevant phase continuously.

Measurement

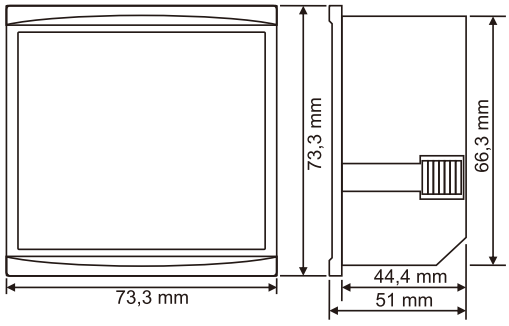
Measuring Range	
Current Measurement	100mA ~ 5,5A AC; 10/5A ~ 995/5A (...x5)
Voltage Meas.Range	10 ~ 500V AC

Specifications

Operating Voltage(Un)	150V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	0°C ~ 55°C
Current Measurement Range	100mA ~ 5,5A AC
Current Transformer	10/5A ~ 995/5A (...x5)
Measurement Precision	±1%
Voltage Measurement Range	10 ~ 500V AC
Display	2 x 3 digit 14mm
Connection Type	Plug-in Terminal
Cable Diameter	1.5mm²
Weight	<310gr.
Panel Hole Sizes	91x91mm(96x96),68x68mm(72x72)
Mounting	Front panel mounted.
Protection Class	IP41
Operating Altitude	<2000 meter



Dimensions for DAV-96



Dimensions for DAV-72

Ordering

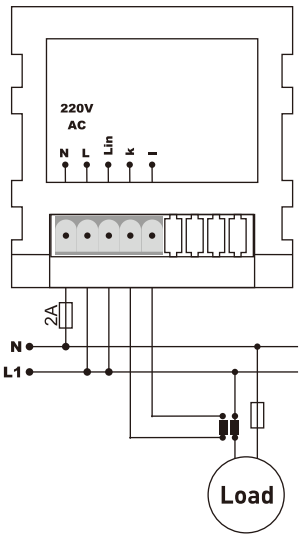
D A V - 7 2 - 1 1 0

① ② ③

①	Type		
②	Size	96	96x96
		72	72x72
③	Operating Voltage(Un)	110	110VAC
		220	150 ~ 270VAC (Can be omitted)

DAV-96D / 72D / 109 / 107 / 209 / 207

Ammeter and Voltmeter (Included C.T)



General Description

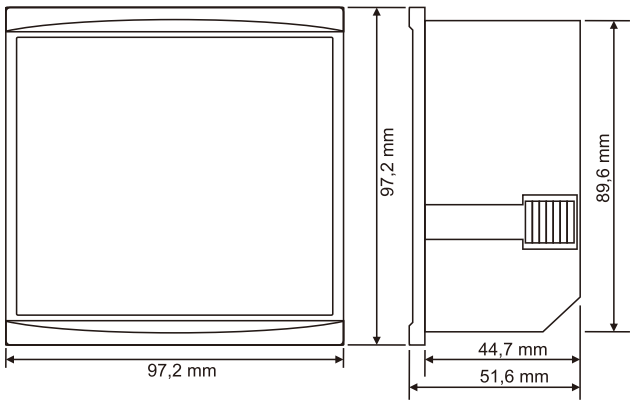
Frequencymeter is designed to watch frequency between phase-neutral or phase-phase.

Measurement

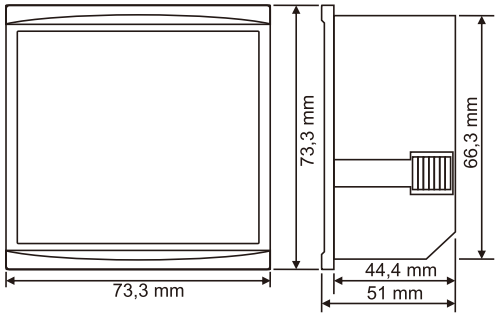
Measuring Range	
Frequency Meas. Range	1 ~ 400Hz (15V ~ 500V AC)

Specifications

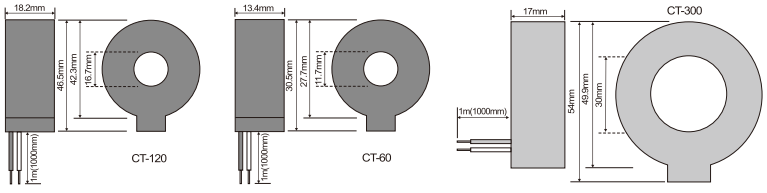
Operating Voltage(Un)	140V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	-20°C ~ 55°C
Frequency Meas. Range	1 ~ 400Hz (15V ~ 500V AC)
Measurement Precision	±1%
Display	20mm(96),14mm(72,36),9mm(48) dissplay
Connection Type	Plug-in Terminal
Cable Diameter	1.5mm²
Weight	<330gr.(1 ~ 63A); <370gr.(10 ~ 100A); <380gr.(10 ~ 250A)
Panel Hole Sizes	91x91mm(96),68x68mm(72),46x46mm(48),31x72mm(36)
Mounting	Front panel mounted.
Protection Class	IP41
Operating Altitude	<2000 meter



Dimensions for 96x96



Dimensions for 72x72



Ordering

D	A	V	-	7	2	D	-	1	1	0
①				②				③		

①	Type		
②	Size&Current Meas.Range	96D	96x96 (1 ~ 63A)
		72D	72x72 (1 ~ 63A)
		109	96x96 (10 ~ 100A)
		107	72x72 (10 ~ 100A)
		209	96x96 (10 ~ 250A)
		207	72x72 (10 ~ 250A)
③	Operating Voltage(Un)	110	110VAC
		220	150 ~ 270VAC (Can be omitted)

DAV-DIN

Ammeter and Voltmeter (Din-rail Type)

General Description

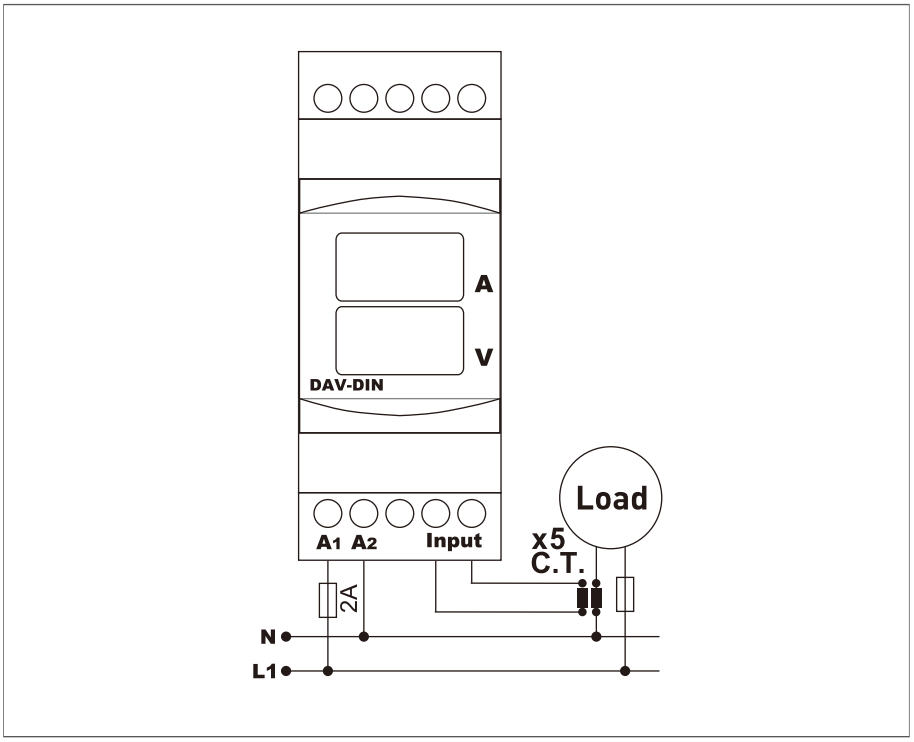
Digital voltmeter and ammeter are designed to monitor both AC current value drawn by the loads and the voltage value of the relevant phase continuously.

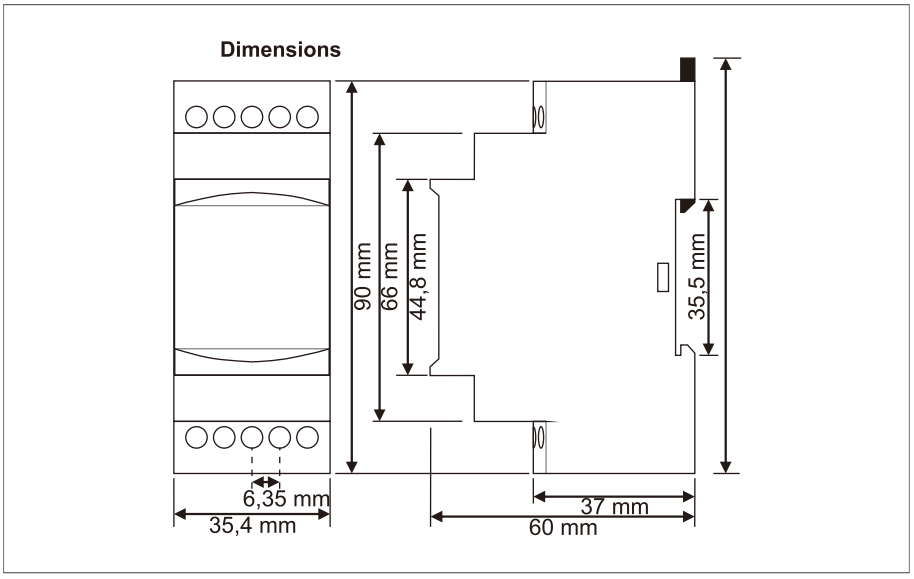
Measurement

Measuring Range	
Current Meas.Range	100mA ~ 995/5A (...x5)
Voltage Meas.Range	10 - 500V AC

Specifications

Operating Voltage(Un)	150V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	-20°C ~ 55°C
Current Measurement Range	100mA ~ 5,5A AC
Current Transformer	50/5A,75/5A,100/5A,150/5A,200/5A,250/5A,300/5A,400/5A, 500/5A,600/5A,800/5A,1000/5A
Measurement Precision	±1%
Voltage Measurement Range	10 ~ 500V AC
Display	2 x 3 digit 9mm
Connection Type	Terminal
Cable Diameter	1.5mm²
Weight	<200gr.
Mounting	Vertical assembled in the panel or assembled on the din rail.
Protection Class	IP41
Operating Altitude	<2000 meter





Ordering

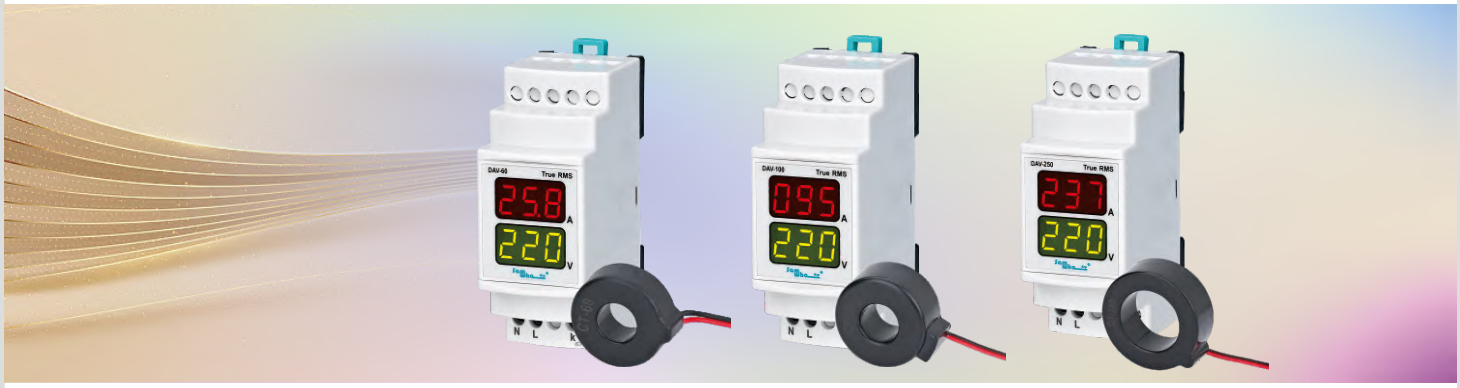
D	A	V	-	D	I	N	-	1	1	0
①				②				③		

①	Type				
②	Current Meas. Range	DIN	100mA ~ 5.5A	300/5	300A
		50/5	50A	400/5	400A
		75/5	75A	500/5	500A
		100/5	100A	600/5	600A
		200/5	200A	800/5	800A
		250/5	250A	1000/5	1000A
③	Operating Voltage(Un)	110	110VAC		
		220	150 ~ 270VAC (Can be omitted)		

※ Current transformer not included

DAV-60,DAV-100,DAV-250

Ammeter and Voltmeter (Included C.T) (Din-rail Type)



General Description

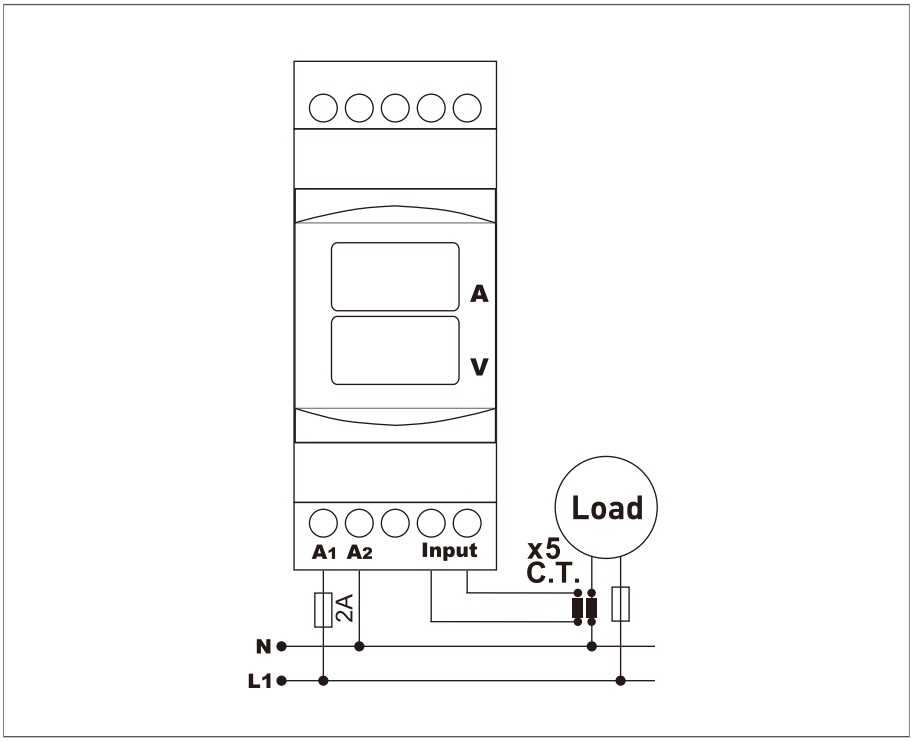
Digital voltmeter and ammeter are designed to monitor both AC current value drawn by the loads and the voltage value of the relevant phase continuously.

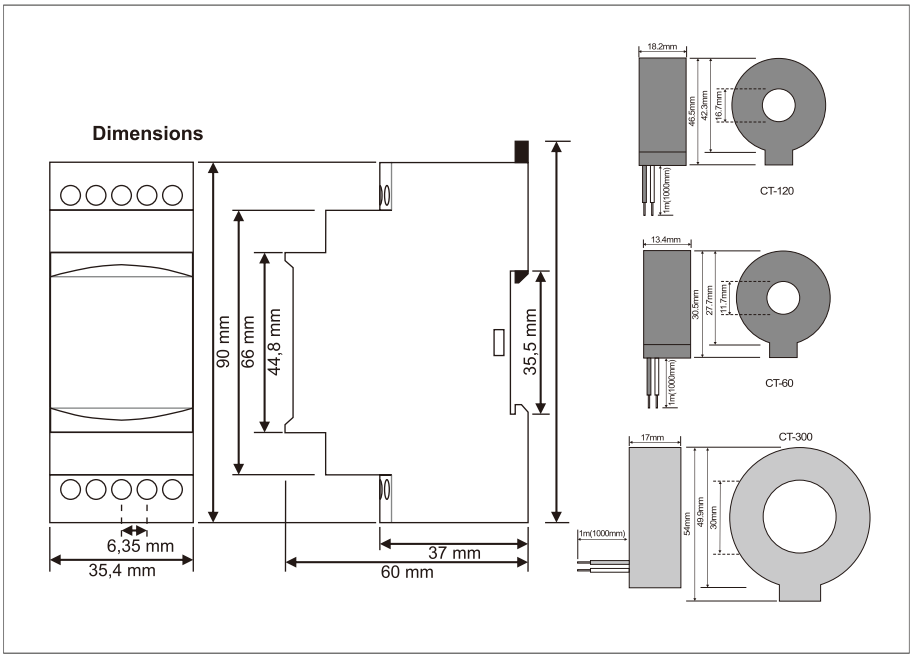
Measurement

Measuring Range	
Current Meas.Range	1 ~ 63A(DAV-60);10 ~ 100A(DAV-100)10 ~ 250A(DAV-250)
Voltage Meas.Range	10 ~ 500V AC

Specifications

Operating Voltage(Un)	150V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	-20ºC ~ 55ºC
Current Transformer	1 ~ 63A(96D,72D);10 ~ 100A(109,107);10 ~ 250A(209,207)
Measurement Precision	±1%
Voltage Measurement Range	10 - 500V AC
Display	2 x 3 digit 9mm
Connection Type	Terminal
Cable Diameter	1.5mm²
Weight	<200gr.(DAV-60); <240gr.(DAV-100); <250gr.(DAV-250)
Mounting	Vertical assembled in the panel or assembled on the din rail.
Protection Class	IP41
Operating Altitude	<2000 meter





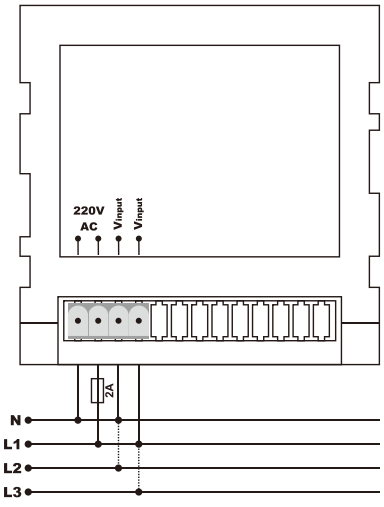
Ordering

D	A	V	-	6	0	-	1	1	0
	①			②			③		

①	Type		
②	Current Meas.Range	60	1 ~ 63A
		100	10 ~ 100A
		250	10 ~ 250A
③	Operating Voltage(Un)	110	110VAC
		220	150 ~ 270VAC (Can be omitted)

SDM-F96 / F72 / F48 / F36

Frequencymeter



General Description

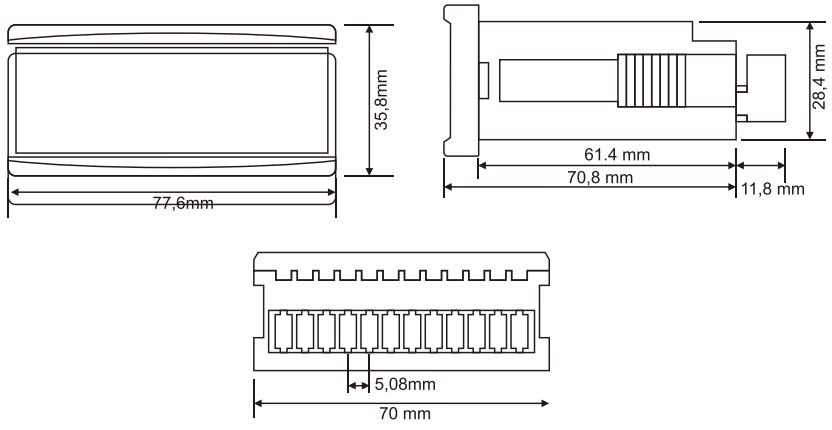
Digital voltmeter and ammeter are designed to monitor both AC current value drawn by the loads and the voltage value of the relevant phase continuously.

Measurement

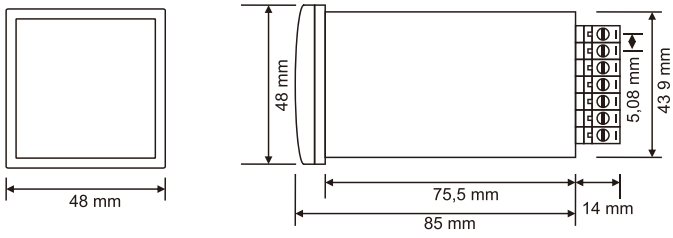
Measuring Range	
Current Meas.Range	1 ~ 63A(96D,72D); 10 ~ 100A(109,107); 10 ~ 250A(209,207)
Voltage Meas.Range	10 ~ 500V AC

Specifications

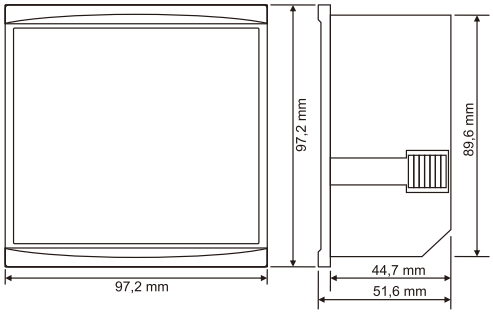
Operating Voltage(Un)	150V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	0°C ~ 55°C
Current Transformer	1 ~ 63A(96D,72D); 10 ~ 100A(109,107); 10 ~ 250A(209,207)
Measurement Precision	±1%
Voltage Measurement Range	10 ~ 500V AC
Display	2 x 3 digit 14mm
Connection Type	Plug-in Terminal
Cable Diameter	1.5mm²
Weight	<300gr.
Panel Hole Sizes	91x91mm(96),68x68mm(72),46x46mm(48),31x72mm(36)
Mounting	Front panel mounted.
Protection Class	IP41
Operating Altitude	<2000 meter



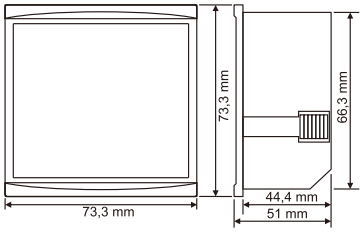
Dimensions for SDM-F36



Dimensions for SDM-F48



Dimensions for SDM-F96



Dimensions for SDM-F72

Ordering

S	D	M	-	F	9	6	-	1	1	0
①				②				③		

①	Type		
②	Frequency meter Size	F96	96x96
		F72	72x72
		F48	48x48
		F36	36x96
③	Operating Voltage(Un)	110	110VAC
		220	140 ~ 270VAC (Can be omitted)

DF-DIN

Frequencymeter (Din-rail Type)

General Description

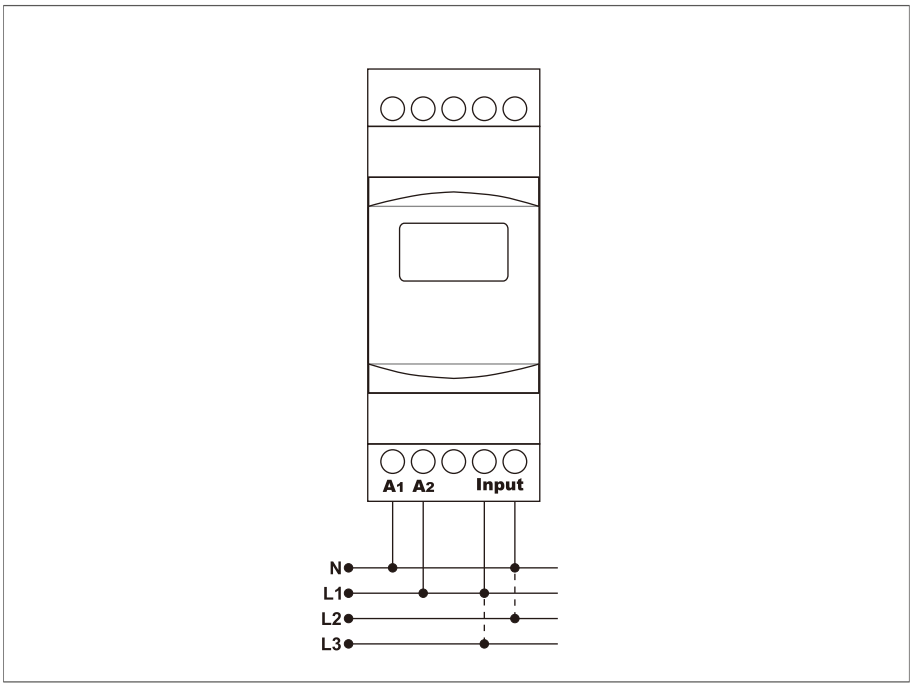
Frequencymeter is designed to watch frequency between phase-neutral or phase-phase.

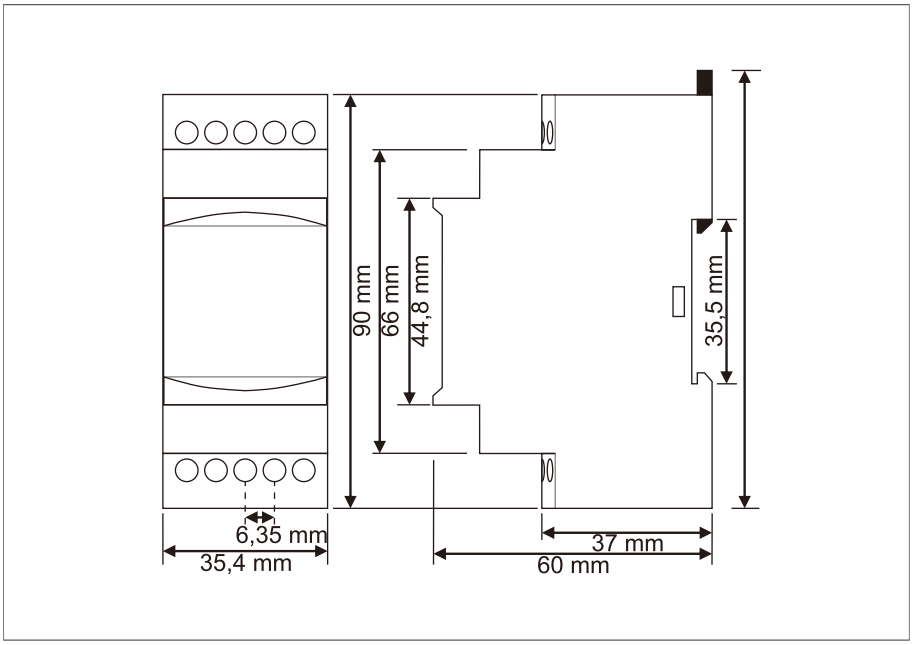
Measurement

Measuring Range	
Frequency Meas. Range	1 ~ 400Hz (15V ~ 500V AC)

Specifications

Operating Voltage(Un)	140V ~ 270V AC or 110VAC
Operating Frequency	50/60Hz.
Operating Power	<6VA
Operating Temperature	-20°C ~ 55°C
Frequency Meas. Range	1 ~ 400Hz (15V ~ 500V AC)
Measurement Precision	±1%
Display	9mm 3 digit
Connection Type	Terminal
Cable Diameter	1.5mm²
Weight	<180gr.
Mounting	Vertical assembled in the panel or assembled on the din rail.
Protection Class	IP41
Operating Altitude	<2000 meter





Ordering

D	F	-	D	I	N	-	1	1	0
①							②		

①	Type		
②	Operating Voltage(Un)	110	110VAC
		220	140 ~ 270VAC (Can be omitted)

DA-VIP04

Adjustable Ammeter

General Description

Adjustable ammeter designed to prevent damage to the system by controlling the current drawn by the loads in the system. The device can control the system according to the connection pattern or can only give warning

Measurement

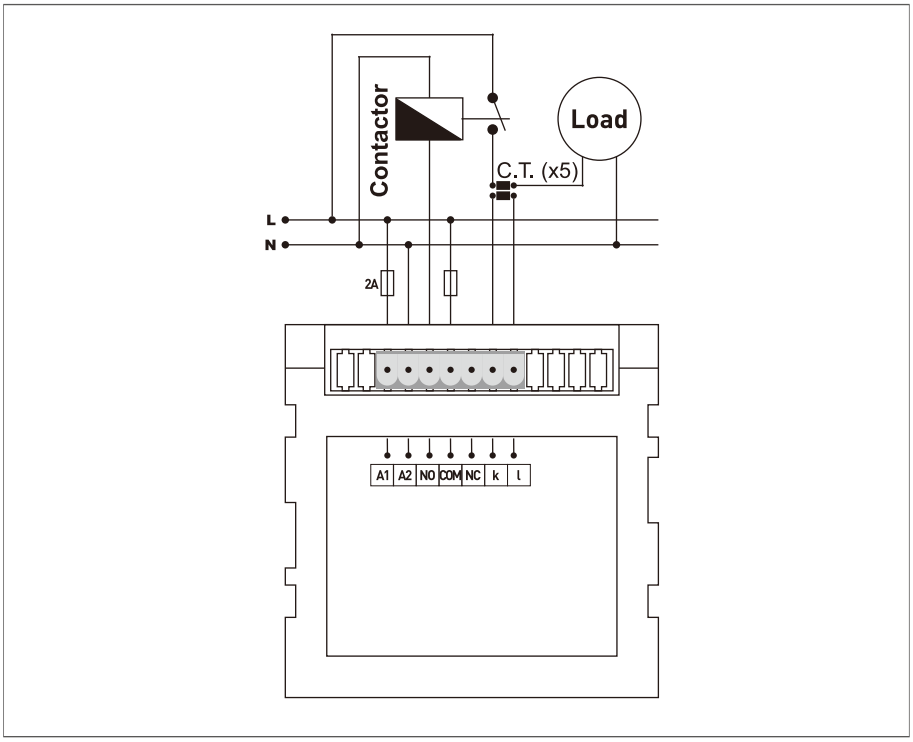
Measuring Range	
Current Meas.Range	100mA ~ 5,5A AC; 5/5A ~ 800/5A (...x5)
Current Protection Range	5 ~ 800A

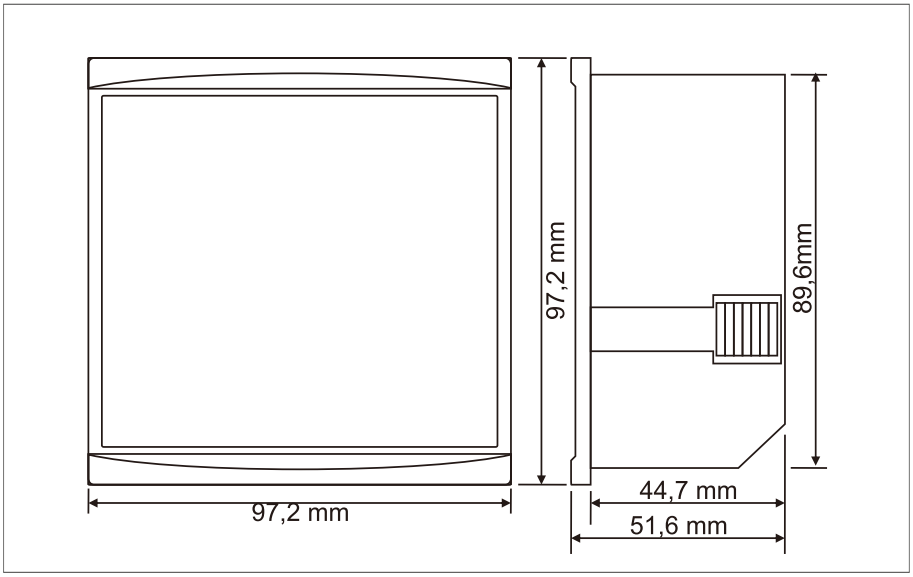
Relay output Status

Normal Running: NO ⊣ ⊢ COM Open, NC ⊣⊢ COM Close
After Tripping : NO ⊣ ⊢ COM Close, NC ⊣⊢ COM Open

Specifications

Operating Voltage(Un)		150V ~ 270V AC or 110VAC
Operating Frequency		50/60Hz.
Operating Power		<4VA
Operating Temperature		-20°C ~ 55°C
Current Measurement Range		100mA ~ 5,5A AC
Current Transformer		5/5A ~ 800/5A (...x5)
Measurement Precision		±1%
Output	Contact	1-SPDT(1c)
	Condition	Normal Running: NO ⊣ ⊢ COM Open, NC ⊣⊢ COM Close
		After Tripping : NO ⊣ ⊢ COM Close, NC ⊣⊢ COM Open
Display		3 x 20mm,3 x 14mm Display
Connection Type		Plug-in Terminal
Cable Diameter		1.5mm²
Weight		<350gr.
Panel Hole Sizes		91x91mm
Mounting		Front panel mounted.
Protection Class		IP20
Operating Altitude		<2000 meter





Ordering

D A - V I P - 1 1 0

① ②

①	Type		
②	Operating Voltage(Un)	110	110VAC
		220	150 ~ 270VAC (Can be omitted)

DA-VIP-60D / 100D / 250D

Adjustable Ammeter (Included C.T)

General Description

Adjustable ammeter designed to prevent damage to the system by controlling the current drawn by the loads in the system. The device can control the system according to the connection pattern or can only give warning

Measurement

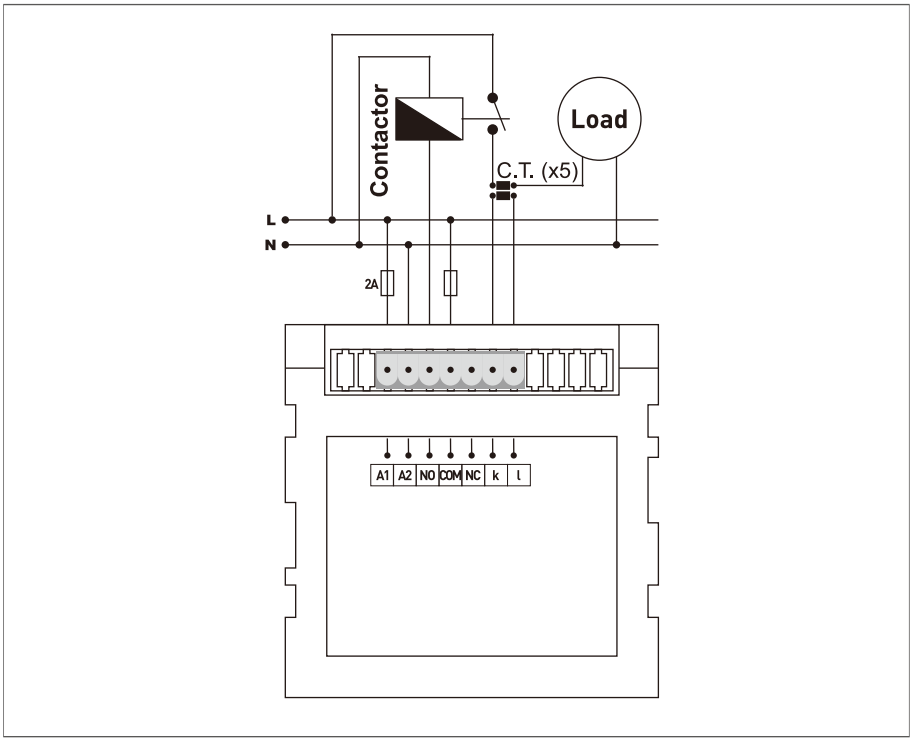
Measuring Range	
Current Meas.Range	1 ~ 63A(60D); 10 ~ 100A(100D); 10 ~ 250A(250D)
Current Protection Range	1 ~ 63A(60D); 10 ~ 100A(100D); 10 ~ 250A(250D)

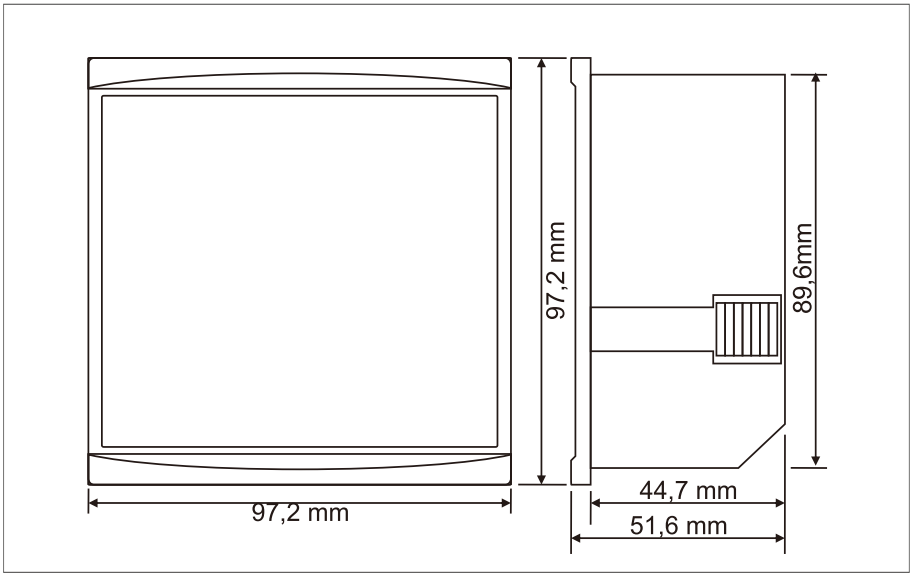
Relay output Status

Normal Running: NO ⊣ ⊢ COM Open, NC ⊣⊢ COM Close
After Tripping : NO ⊣ ⊢ COM Close, NC ⊣⊢ COM Open

Specifications

Operating Voltage(Un)		150V ~ 270V AC or 110VAC
Operating Frequency		50/60Hz.
Operating Power		<4VA
Operating Temperature		-20°C ~ 55°C
Current Transformer		1 ~ 63A(60D); 10 ~ 100A(100D); 10 ~ 250A(250D)
Measurement Precision		±1%
Output	Contact	1-SPDT(1c)
	Condition	Normal Running: NO ⊣ ⊢ COM Open, NC ⊣⊢ COM Close
		After Tripping : NO ⊣ ⊢ COM Close, NC ⊣⊢ COM Open
Display		3 x 20mm,3 x 14mm Display
Connection Type		Plug-in Terminal
Cable Diameter		1.5mm²
Weight		<360gr.(60D); <400gr.(100D); <410gr.(250D)
Panel Hole Sizes		91x91mm
Mounting		Front panel mounted.
Protection Class		IP41
Operating Altitude		<2000 meter





Ordering

D A - V I P - 6 0 D - 1 1 0

① ② ③

①	Type		
②	Current Meas. Range	60D	1 ~ 63A
		100D	10 ~ 100A
		250D	10 ~ 250A
③	Operating Voltage(Un)	110	110VAC
		220	150 ~ 270VAC (Can be omitted)

Timer

ERV-XX
Electronic Single Function Time Relay (On Delay)
72/page

ERV-XXM
Electronic Single Function Time Relay (Off Delay)
74/page

ERV-08
Electronic Multifunction Time Relay (On Delay)
76/page

ERV-08M
Electronic Multifunction Time Relay (Off Delay)
78/page

ERS-07
Electronic Right-Left Time Relay (Inverser)
88/page

ERV-09
Electronic Double Adjustable And Multifunctional Flasher Relay
90/page

ERX-10
Electronic 10 Functions Time Relay
92/page

ERX-20
Electronic 10 Functions Time Relay (Wide Voltage:24~240VAC/DC)
94/page

DRV-XX
Digital Single Function Time Relay (On Delay)
80/page

DRV-XXM
Digital Single Function Time Relay (Off Delay)
82/page

DRV-08
Digital Multifunction Time Relay(On Delay)
84/page

DRV-08M
Digital Multifunction Time Relay(Off Delay)
86/page

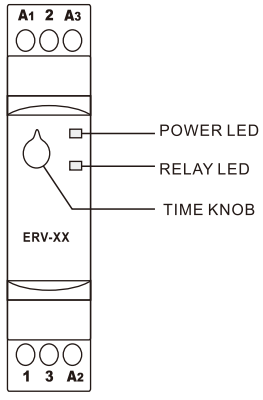
MCB-10
Digital 10 Functions Time Relay
96/page

MCB-20
Digital 10 Functions Time Relay (Wide Voltage:24~240VAC/DC)
98/page

ERV-YU
Electronic Star Delta Time Relay
100/page

ERV-XX

Electronic Single Function Time Relay (On Delay)



Terminal(A1-A2):POWER SUPPLY<1>
Terminal(A2-A3):POWER SUPPLY<2>
Terminal(1-2-3):RELAY OUTPUT

General Description

ERV-XX timer relays are used in all fields (industry,house,plant etc.)need controlls related to the time.

Function

Function Item	Approach
On Delay	Time knob

Electric Reset

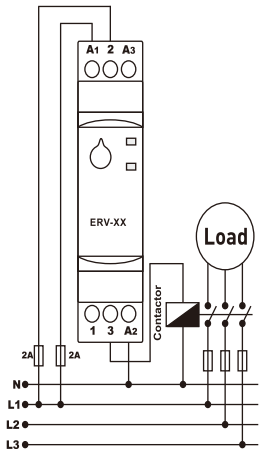
Turn off the power(A1-A2) or (A2-A3).Remote reset is possible to install the SW on afar.

Relay output Status

When powered: 1⊣⊢2 Close, 2⊣ ⊢3 Open
When end of the delay: 1⊣⊢2 Open, 2⊣ ⊢3 Close

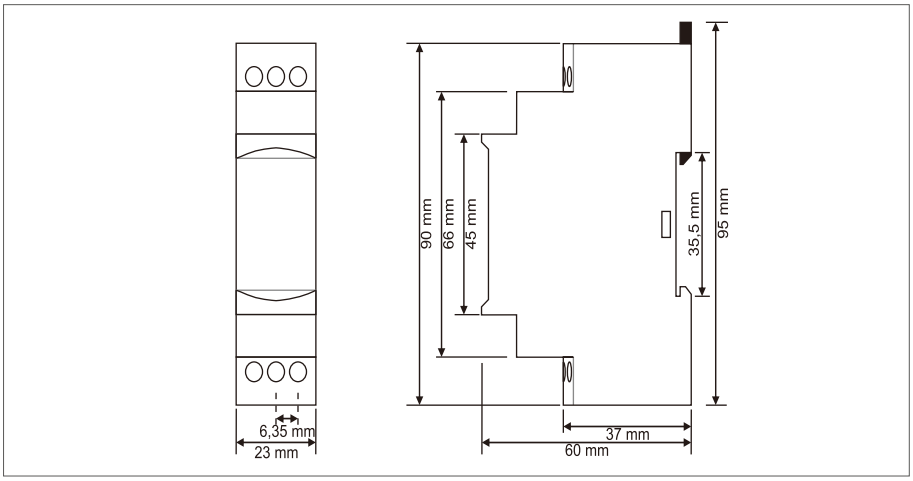
LED Indication

Condition	ON(Green)LED	Out(Red)LED	Remarks
Power	○	×	○:ON
Delaying	○	◑	◑:Blink
End of delay	○	○	×:OFF



Specifications

Time Range		Type	Range
		03	0.1 ~ 3sec.
		06	0.1 ~ 6sec.
		12	0.1 ~ 12sec.
		30	0.1 ~ 30sec.
		60	0.1 ~ 60sec.
		03D	0.1 ~ 3min.
		06D	0.1 ~ 6min.
		12D	0.1 ~ 12min.
		30D	0.1 ~ 30min.
		60D	0.1 ~ 60min.
Reset			Electric Reset
Indicator			LED
Operating Voltage	Voltage range	12	12VAC/DC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		150~260	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)
		380	380VAC(A1-A2)
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When powered: 1⊣⊬2 Close, 2⊣⊢3 Open
			When end of the delay: 1⊣⊬2 Open, 2⊣⊢3 Close
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<75gr.



Ordering

E R V - 0 3 D - 1 1 0

① ② ③

①	Model				
②	Time Range	03	0.1 ~ 3sec.	03D	0.1 ~ 3min.
		06	0.1 ~ 6sec.	06D	0.1 ~ 6min.
		12	0.1 ~ 12sec.	12D	0.1 ~ 12min.
		30	0.1 ~ 30sec.	30D	0.1 ~ 30min.
		60	0.1 ~ 60sec.	60D	0.1 ~ 60min.
③	Operating Voltage	12	12VAC/DC(A2-A3)		
		110	110VAC(A1-A2),24VAC/DC(A2-A3)		
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)(Can be omitted)		
		380	380VAC(A1-A2)		

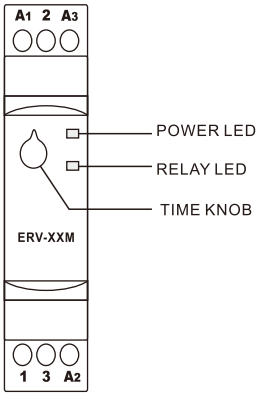
※ Due to the resolution, please try to choose a model that is close to the actual usage time. (For example, if actually use 5 seconds, can choose ERV-12, ERV-30, but if you choose ERV-60D (60 minutes), it is difficult to achieve the ideal setting time.)

ERV-XXM

Electronic Single Function Time Relay (Off Delay)

General Description

ERV-XXM timer relays are used in all fields (industry,house,plant etc.) need controlls related to the time.



Terminal(A1-A2):POWER SUPPLY<1>
Terminal(A2-A3):POWER SUPPLY<2>
Terminal(1-2-3):RELAY OUTPUT

Function

Function Item	Approach
Off Delay	Time knob

Electric Reset

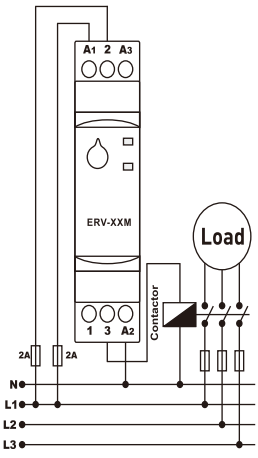
Turn off the power(A1-A2) or (A2-A3).Remote reset is possible to install the SW on afar.

Relay output Status

When powered: 1⊀⊁2 Open, 2⊣⊢3 Open
When end of the delay: 1⊀⊁2 Close, 2⊣⊢3 Open

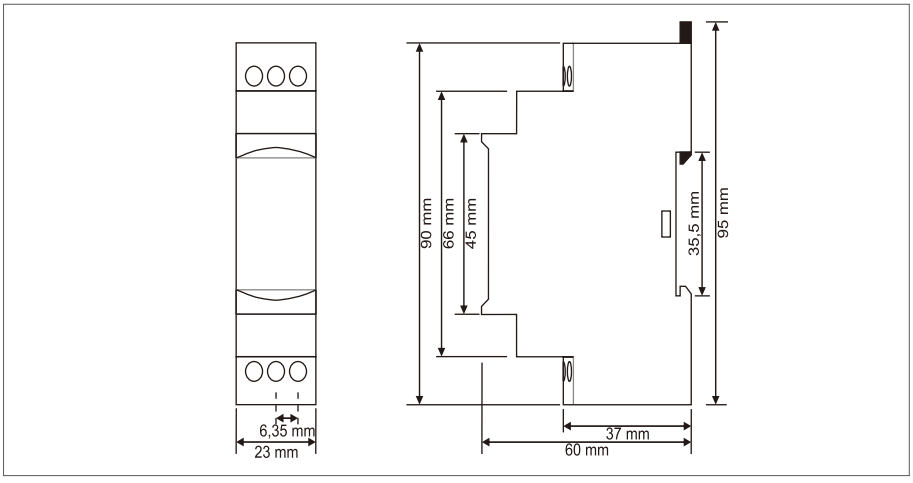
LED Indication

Condition	ON(Green)LED	Out(Red)LED	Remarks
Power	○	×	○:ON
Delaying	○	◑	◑:Blink
End of delay	○	○	×:OFF



Specifications

Time Range		Type	Range
		03M	0.1 ~ 3sec.
		06M	0.1 ~ 6sec.
		12M	0.1 ~ 12sec.
		30M	0.1 ~ 30sec.
		60M	0.1 ~ 60sec.
		03DM	0.1 ~ 3min.
		06DM	0.1 ~ 6min.
		12DM	0.1 ~ 12min.
		30DM	0.1 ~ 30min.
		60DM	0.1 ~ 60min.
Reset			Electric Reset
Indicator			LED
Operating Voltage	Voltage range	12	12VAC/DC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)
		380	380VAC(A1-A2)
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When powered: 1⊣⊬2 Open, 2⊣⊢3 Close
			When end of the delay: 1⊣⊬2 Close, 2⊣⊢3 Open
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<75gr.



Ordering

E R V - 0 6 M - 1 1 0

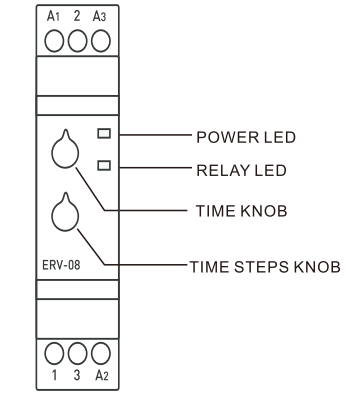
① ② ③

①	Model				
②	Time Range	03M	0.1 ~ 3sec.	03DM	0.1 ~ 3min.
		06M	0.1 ~ 6sec.	06DM	0.1 ~ 6min.
		12M	0.1 ~ 12sec.	12DM	0.1 ~ 12min.
		30M	0.1 ~ 30sec.	30DM	0.1 ~ 30min.
		60M	0.1 ~ 60sec.	60DM	0.1 ~ 60min.
③	Operating Voltage	12	12VAC/DC(A2-A3)		
		110	110VAC(A1-A2),24VAC/DC(A2-A3)		
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)(Can be omitted)		
		380	380VAC(A1-A2)		

※ Due to the resolution, please try to choose a model that is close to the actual usage time. (For example, if actually use 5 seconds, can choose ERV-12M, ERV-30M, but if you choose ERV-60DM (60 minutes), it is difficult to achieve the ideal setting time.)

ERV-08

Electronic Multifunction Time Relay (On Delay)



Terminal(A1-A2):POWER SUPPLY<1>
Terminal(A2-A3):POWER SUPPLY<2>
Terminal(1-2-3):RELAY OUTPUT

General Description

ERV-08 timer relays are used in all fields (industry,house,plant etc.) need controlls related to the time.

Function

Function Item	Approach
On Delay	Time knob
Time Range	Time steps knob

Electric Reset

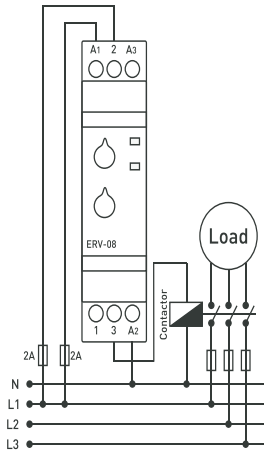
Turn off the power(A1-A2) or (A2-A3).Remote reset is possible to install the SW on afar.

Relay output Status

When powered: 1⊣⊢2 Close, 2⊣ ⊢3 Open
When end of the delay: 1⊣⊢2 Open, 2⊣ ⊢3 Close

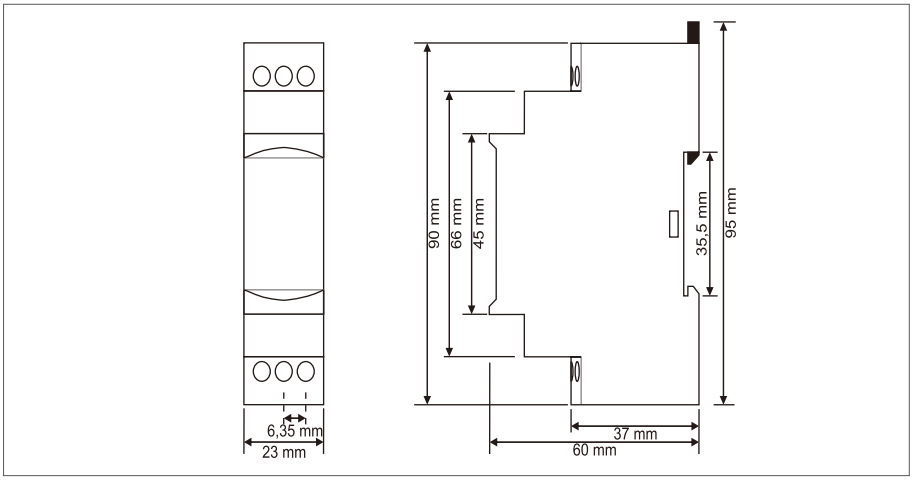
LED Indication

Condition	ON(Green)LED	Out(Red)LED	Remarks
Power	○	×	○:ON
Delaying	○	◑	◑:Blink
End of delay	○	○	×:OFF



Specifications

Time Range			0.1sec. ~ 100hours
Reset			Electric Reset
Indicator			LED
Operating Voltage	Voltage range	12	12VAC/DC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)
		380	380VAC(A1-A2)
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When powered: 1⊣⊬2 Close, 2⊣ ⊢3 Open
			When end of the delay: 1⊣⊬2 Open, 2⊣ ⊢3 Close
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<75gr.



Ordering

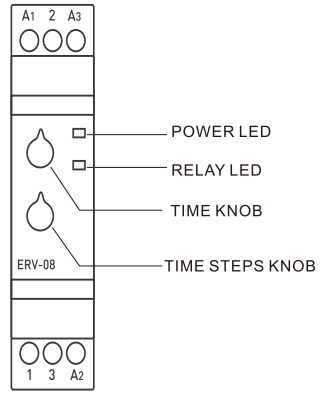
E R V - 0 8 - 1 1 0

① ②

①	Model		0.1sec ~ 100hours
②	Operating Voltage	12	12VAC/DC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)(Can be omitted)
		380	380VAC(A1-A2)

ERV-08M

Electronic Multifunction Time Relay (Off Delay)



Terminal(A1-A2):POWER SUPPLY<1>
Terminal(A2-A3):POWER SUPPLY<2>
Terminal(1-2-3):RELAY OUTPUT

General Description

ERV-XX timer relays are used in all fields (industry,house,plant etc.) need controlls related to the time.

Function

Function Item	Approach
On Delay	Time knob
Time Range	Time steps knob

Electric Reset

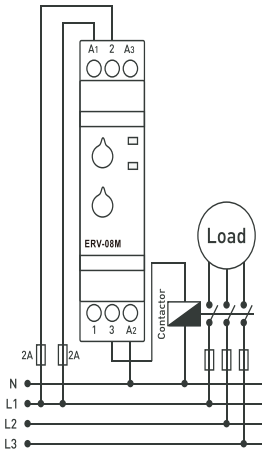
Turn off the power(A1-A2) or (A2-A3).Remote reset is possible to install the SW on afar.

Relay output Status

When powered: 1⊣⊬2 Open, 2⊣⊢3 Close
When end of the delay: 1⊣⊬2 Close, 2⊣⊢Open

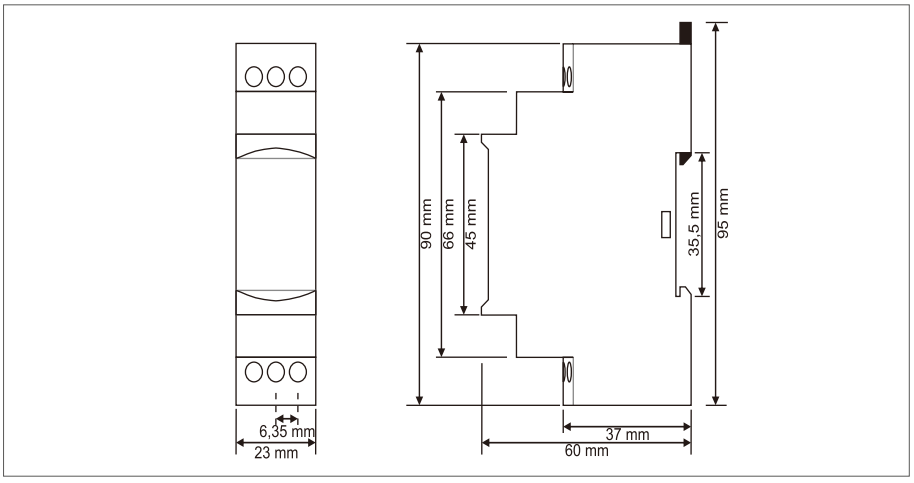
LED Indication

Condition	ON(Green)LED	Out(Red)LED	Remarks
Power	○	×	○:ON
Delaying	○	◑	◑:Blink
End of delay	○	○	×:OFF



Specifications

Time Range			0.1sec. ~ 100hours
Reset			Electric Reset
Indicator			LED
Operating Voltage	Voltage range	12	12VAC/DC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)
		380	380VAC(A1-A2)
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When powered: 1⊣⊢2 Open, 2⊣⊢3 Close
			When end of the delay: 1⊣⊢2 Close, 2⊣⊢3 Open
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<75gr.



Ordering

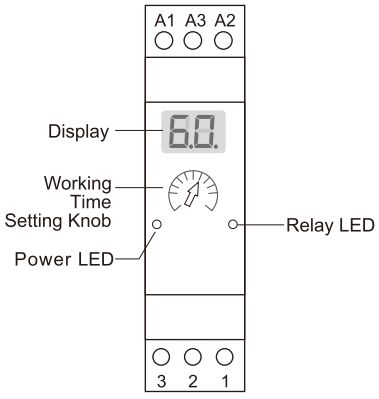
E R V - 0 8 M - 1 1 0

① ②

①	Model		0.1sec ~ 100hours
②	Operating Voltage	12	12VAC/DC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)(Can be omitted)
		380	380VAC(A1-A2)

DRV-XX

Digital Single Function Time Relay (On Delay)



Terminal(A1-A2):POWER SUPPLY<1>
Terminal(A2-A3):POWER SUPPLY<2>
Terminal(1-2-3):RELAY OUTPUT

General Description

DRV-XX Digital timer relays are used in all fields (industry,house,plant etc.)need controlls related to the time.

Function

Function Item	Approach
On Delay	Time knob

Electric Reset

Turn off the power(A1-A2) or (A2-A3).Remote reset is possible to install the SW on afar.

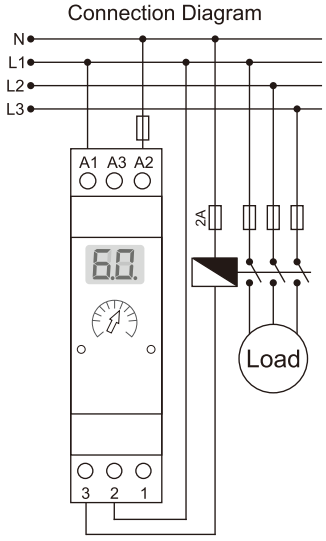
Relay output Status

When powered: 1⊣⊢2 Close, 2⊣ ⊢3 Open
When end of the delay: 1⊣⊢2 Open, 2⊣ ⊢3 Close

LED Indication

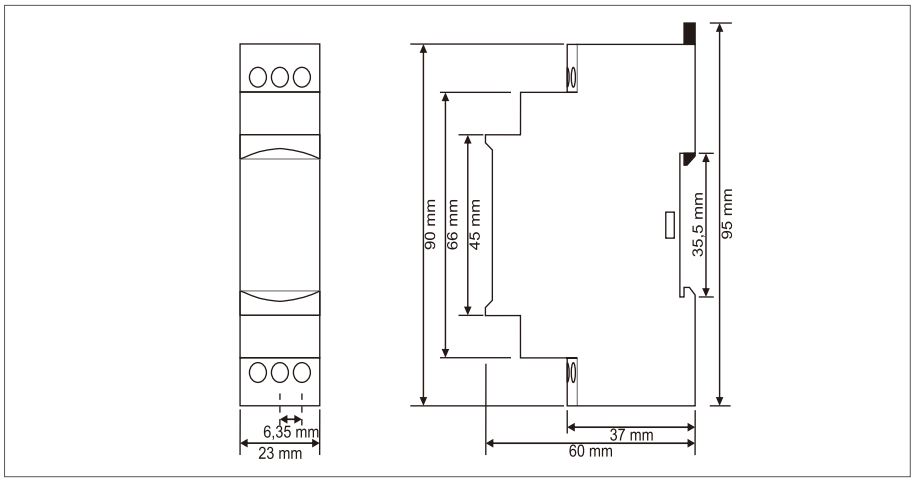
Condition	ON(Green)LED	Out(Red)LED	Remarks
Power	○	×	○:ON ×:OFF
Delaying	○	×	
End of delay	×	○	

Connection Diagram



Specifications

Time Range		Type	Range
		01	0.0 ~ 9.9sec.
		01D	0.0 ~ 9.9min.
		01H	0.0 ~ 9.9hours
		02	0 ~ 9.9sec.
		02D	0 ~ 99min.
		02H	00 ~ 99hours
Reset			Electric Reset
Indicator			Digital
Operating Voltage	Voltage range	12	12VAC/DC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)
		380	380VAC(A1-A2)
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When powered: 1⊣⊢2 Close, 2⊣ ⊢3 Open
			When end of the delay: 1⊣⊢2 Open, 2⊣ ⊢3 Close
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<90gr.



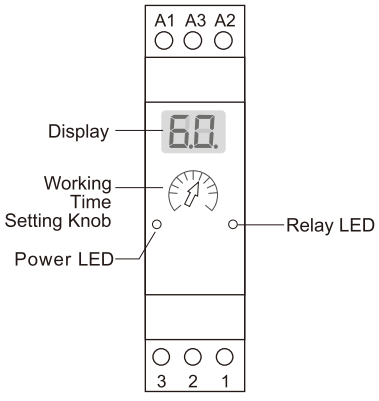
Ordering

D	R	V	-	0	1	D	-	1	1	0
	①				②				③	

①	Model		
②	Time Range	01	0.0 ~ 9.9sec.
		01D	0.0 ~ 9.9min.
		01H	0.0 ~ 9.9hours
		02	0 ~ 9.9sec.
		02D	0 ~ 99min.
		02H	00 ~ 99hours
③	Operating Voltage	12	12VAC/DC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)(Can be omitted)
		380	380VAC(A1-A2)

DRV-XXM

Digital Single Function Time Relay (Off Delay)



Terminal(A1-A2):POWER SUPPLY<1>
Terminal(A2-A3):POWER SUPPLY<2>
Terminal(1-2-3):RELAY OUTPUT

General Description

DRV-XXM timer relays are used in all fields (industry,house,plant etc.)need controlls related to the time.

Function

Function Item	Approach
Off Delay	Time knob

Electric Reset

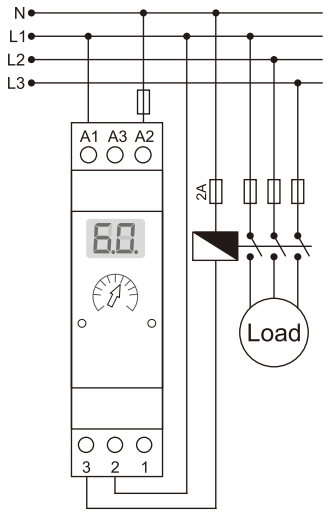
Turn off the power(A1-A2) or (A2-A3).Remote reset is possible to install the SW on afar.

Relay output Status

When powered: 1⊣⊢2 Open, 2⊣⊢3 Close
When end of the delay: 1⊣⊢2 Close, 2⊣⊢3 Open

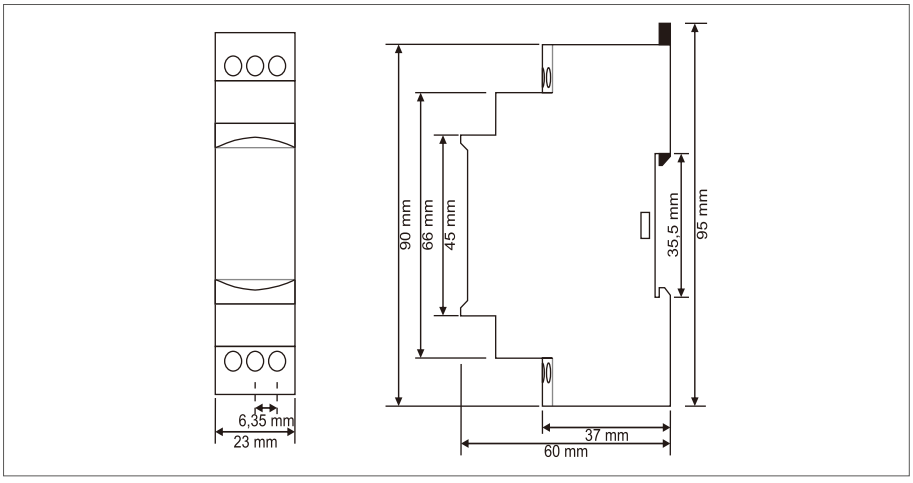
LED Indication

Condition	ON(Green)LED	Out(Red)LED	Remarks
Power	○	×	○:ON ×:OFF
Delaying	○	○	
End of delay	○	×	



Specifications

		Type	Range
Time Range		01M	0.0 ~ 9.9sec.
		01DM	0.0 ~ 9.9min.
		01HM	0.0 ~ 9.9hours
		02M	0 ~ 9.9sec.
		02DM	0 ~ 99min.
		02HM	0 ~ 99hours
Reset			Electric Reset
Indicator			Digital
Operating Voltage	Voltage range	12	12VAC/DC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)
		380	380VAC(A1-A2)
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When powered: 1⊣⊢2 Open, 2⊣⊢3 Close
			When end of the delay: 1⊣⊢2 Close, 2⊣⊢3 Open
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<90gr.



Ordering

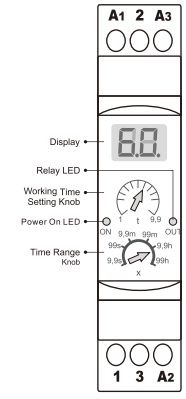
E R V - 0 2 M - 1 1 0

① ② ③

①	Model		
②	Time Range	01M	0.0 ~ 9.9sec.
		01DM	0.0 ~ 9.9min.
		01HM	0.0 ~ 9.9hours
		02M	0 ~ 9.9sec.
		02DM	0 ~ 99min.
		02HM	00 ~ 99hours
③	Operating Voltage	12	12VAC/DC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)(Can be omitted)
		380	380VAC(A1-A2)

DRV-08

Digital Multifunction Time Relay(On Delay)



Terminal(A1-A2):POWER SUPPLY<1>
Terminal(A2-A3):POWER SUPPLY<2>
Terminal(1-2-3):RELAY OUTPUT

General Description

DRV-08 timer relays are used in all fields (industry,house,plant etc.)need controlls related to the time.

Function

Function Item	Approach
On Delay	Time knob
Time Range	X knob

Electric Reset

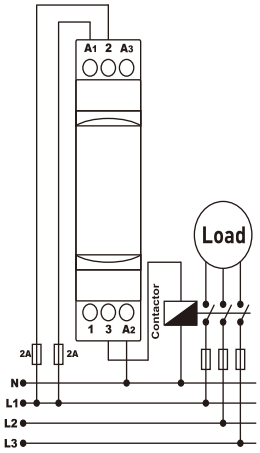
Turn off the power(A1-A2) or (A2-A3).Remote reset is possible to install the SW on afar.

Relay output Status

When powered: 1⊣⊢2 Close, 2⊣ ⊢3 Open
When end of the delay: 1⊣⊢2 Open, 2⊣ ⊢3 Close

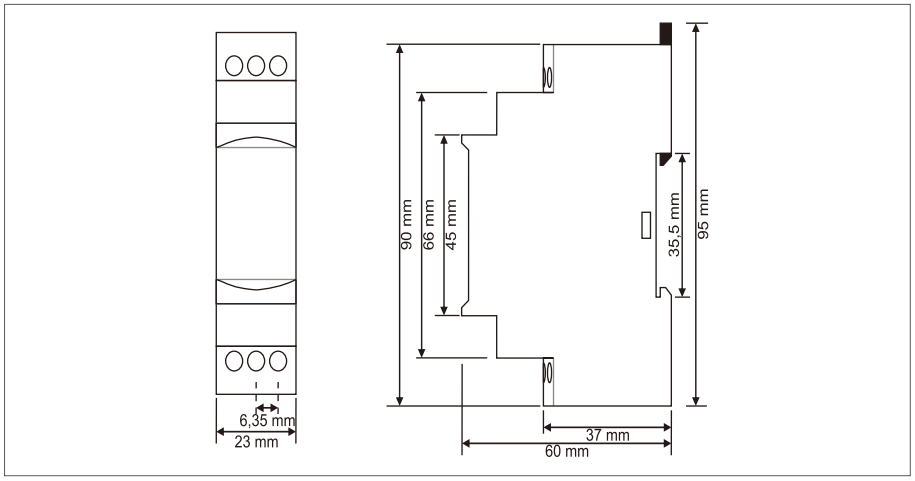
LED Indication

Condition	ON(Green)LED	Out(Red)LED	Remarks
Power	○	×	○:ON ×:OFF
Delaying	○	×	
End of delay	○	○	



Specifications

Time Range			0sec. ~ 99hours
Reset			Electric Reset
Indicator			Digital
Operating Voltage	Voltage range	12	12VAC/DC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)
		380	380VAC(A1-A2)
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When powered: 1⊣⊢2 Close, 2⊣ ⊢3 Open
			When end of the delay: 1⊣⊢2 Open, 2⊣ ⊢3 Close
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<90gr.



Ordering

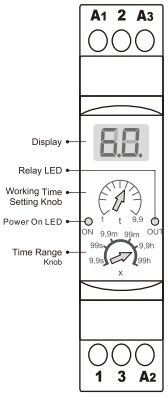
D R V - 0 8 - 1 1 0

① ②

①	Model		0sec. ~ 99hours
②	Operating Voltage	12	12VAC/DC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)(Can be omitted)
		380	380VAC(A1-A2)

DRV-08M

Digital Multifunction Time Relay(Off Delay)



Terminal(A1-A2):POWER SUPPLY<1>
Terminal(A2-A3):POWER SUPPLY<2>
Terminal(1-2-3):RELAY OUTPUT

General Description

DRV-08M timer relays are used in all fields (industry,house,plant etc.)need controlls related to the time.

Function

Function Item	Approach
Off Delay	Time knob
Time Range	X knob

Electric Reset

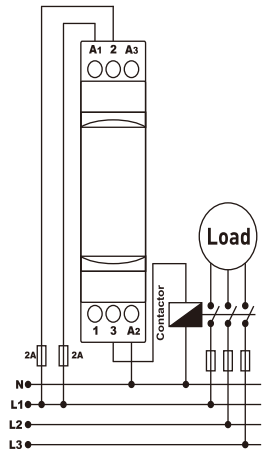
Turn off the power(A1-A2) or (A2-A3).Remote reset is possible to install the SW on afar.

Relay output Status

When powered: 1⊣⊢2 Open, 2⊣⊢3 Close
When end of the delay: 1⊣⊢2 Close, 2⊣⊢3 Open

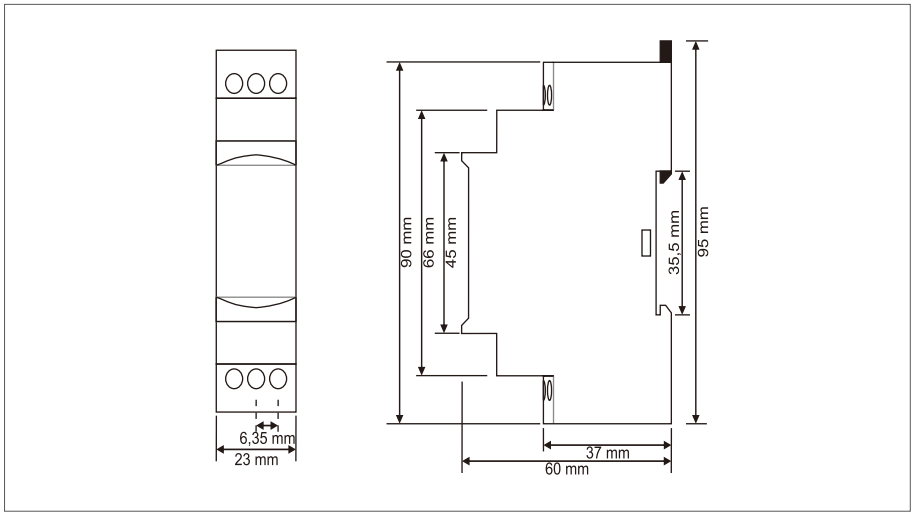
LED Indication

Condition	ON(Green)LED	Out(Red)LED	Remarks
Power	○	○	○:ON ×:OFF
Delaying	○	○	
End of delay	×	×	



Specifications

Time Range			0sec. ~ 99hours
Reset			Electric Reset
Indicator			Digital
Operating Voltage	Voltage range	12	12VAC/DC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)
		380	380VAC(A1-A2)
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When powered: 1⊣⊢2 Open, 2⊣⊢3 Close
			When end of the delay: 1⊣⊢2 Close, 2⊣⊢3 Open
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<90gr.



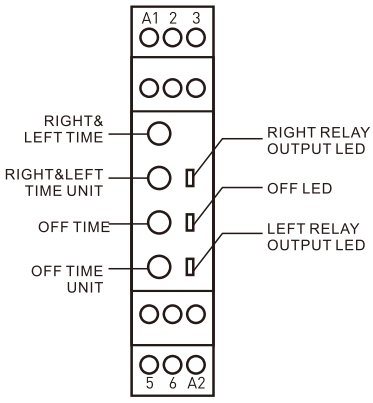
Ordering

D	R	V	-	0	8	M	-	1	1	0
				①				②		

①	Model		0sec. ~ 99hours
②	Operating Voltage	12	12VAC/DC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)(Can be omitted)
		380	380VAC(A1-A2)

ERS-07

Electronic Right-Left Time Relay (Inverser)



Terminal(A1-A2):POWER SUPPLY
Terminal(2-3):RIGHT RELAY OUTPUT
Terminal(5-6): LEFT RELAY OUTPUT

General Description

Right-Left (Inversor) Relay are used for 2 different loads, which works by turn. First load start working, delay end stops and wait (off time) and second load start working. Both working time is same.

Function

Function Item	Approach
Right&Left Time	ON knobs
OFF Time	OFF knobs

Electric Reset

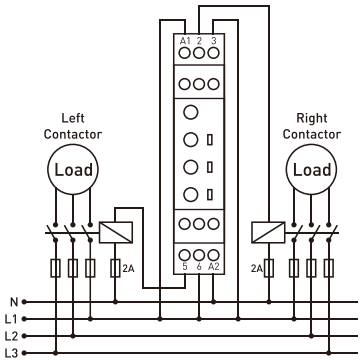
Turn off the power(A1-A2) .Remote reset is possible to install the SW on afar.

Relay output Status

When powered: 2┤├3 Close, 5┤├ 6 Open
When run of the off time: 2 ┤├ 3 Open, 5 ┤├ 6 Open
When run of the left time: 2 ┤├ 3 Open, 5 ┤├ 6 Close
When run of the right time: 2 ┤├ 3 Close, 5┤├ 6 Open

LED Indication

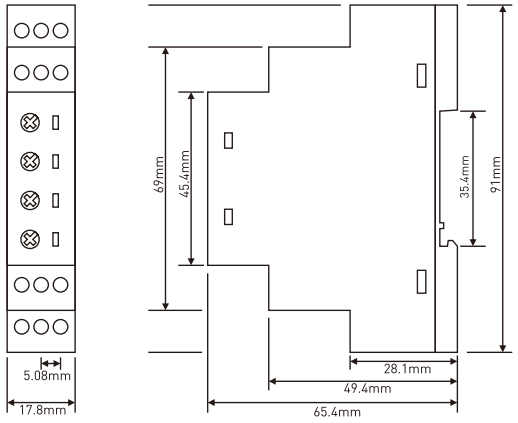
Condition	R(Green)LED	OFF(Red)LED	L(Green)LED	Remarks
Right	◑	×	×	◑:Blink ×:OFF
Off	×	◑	×	
Left	×	×	◑	



Specifications

Time Range			Working time(On): 1sec. ~ 100min.
			Waiting time(Off): 1sec. ~ 100min.
Reset			Electric Reset
Indicator			LED
Operating Voltage	Voltage range	12	12VAC/DC
		24	24VAC/DC
		110	110VAC
		220	150 ~ 260VAC
		380	380VAC
	Frequency		50/60Hz
Output	Contact		2-SPST(2NO)
	Condition		When powered: 2┤├3 Close, 5┤├6 Open
			When run of the off time: 2┤├3 Open, 5┤├6 Open
			When run of the left time: 2┤├3 Open, 5┤├6 Close
			When run of the right time: 2┤├3 Close, 5┤├6 Open
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<75gr.

Dimensions



Ordering

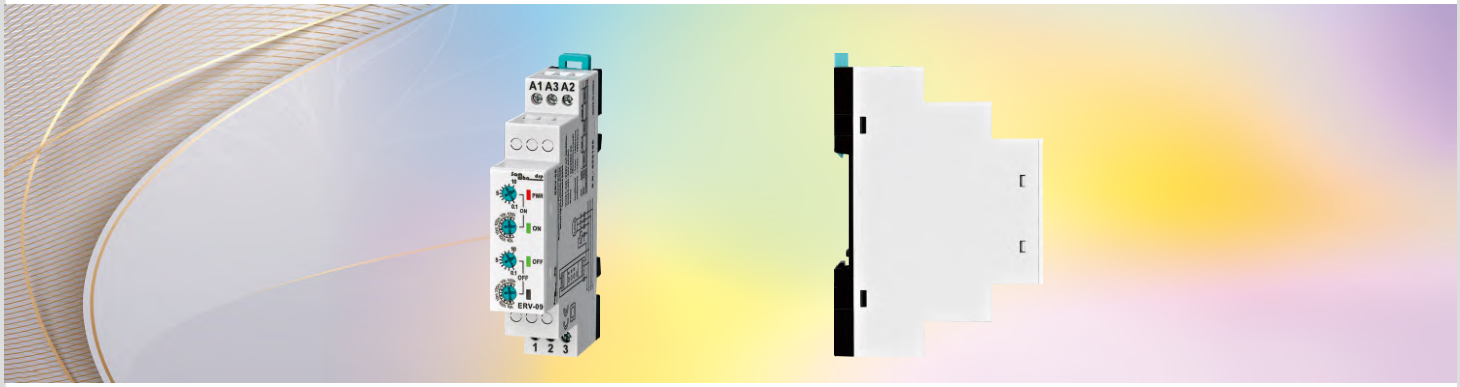
E R V - 0 7 - 2 2 0

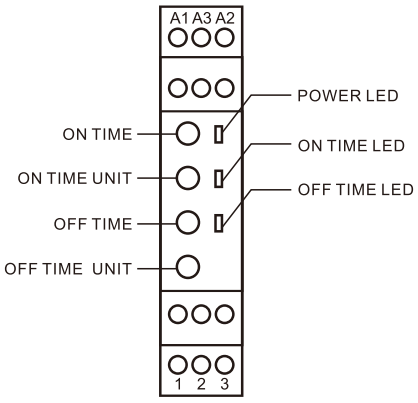
① ②

①	Model		
②	Operating Voltage	12	12VAC/DC
		24	24VAC/DC
		110	110VAC
		220	150 ~ 260VAC(Can be omitted)
		380	380VAC

ERV-09

Electronic Double Adjustable And Multifunctional Flasher Relay





Terminal(A1-A2):POWER SUPPLY<1>
Terminal(A2-A3):POWER SUPPLY<2>
Terminal(1-2-3):RELAY OUTPUT

General Description

ERV-09 timer relays are used in all fields (industry,house,plant etc.)need controlls related to the time.

Function

Function Item	Approach
On Delay	On knobs
Off Delay	Off knobs

Electric Reset

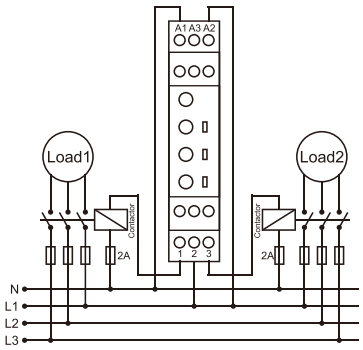
Turn off the power(A1-A2) or (A2-A3).Remote reset is possible to install the SW on afar.

Relay output Status

When run of the on time: 1 ⊣⊢ 2 Open, 2 ⊣ ⊢ 3 Close
When run of the off time : 1 ⊣⊢ 2 Close, 2 ⊣ ⊢ 3 Open

LED Indication

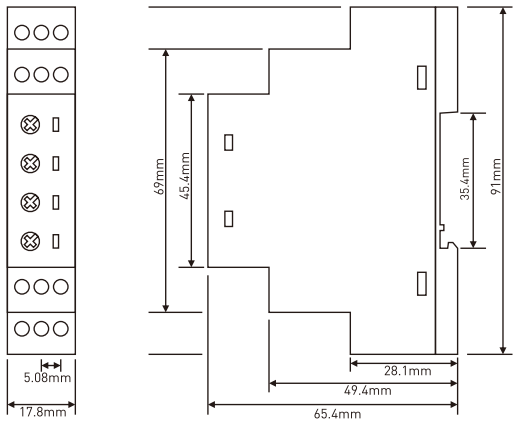
Condition	Power(Red)LED	ON(Green)LED	OFF(Green)LED	Remarks
On time	○	◑	×	◑:Blink ○:ON ×:OFF
Off time	○	×	◑	



Specifications

Time Range			On time: 1sec. ~ 100hours
			Off time: 1sec. ~ 100hours
Reset			Electric Reset
Indicator			LED
Operating Voltage	Voltage range	12	12VAC/DC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)
		380	380VAC(A1-A2)
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When powered: 1⊣⊢2 Close, 2⊣ ⊢3 Open
			When end of the delay: 1⊣⊢2 Open, 2⊣ ⊢3 Close
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<70gr.

Dimensions



Ordering

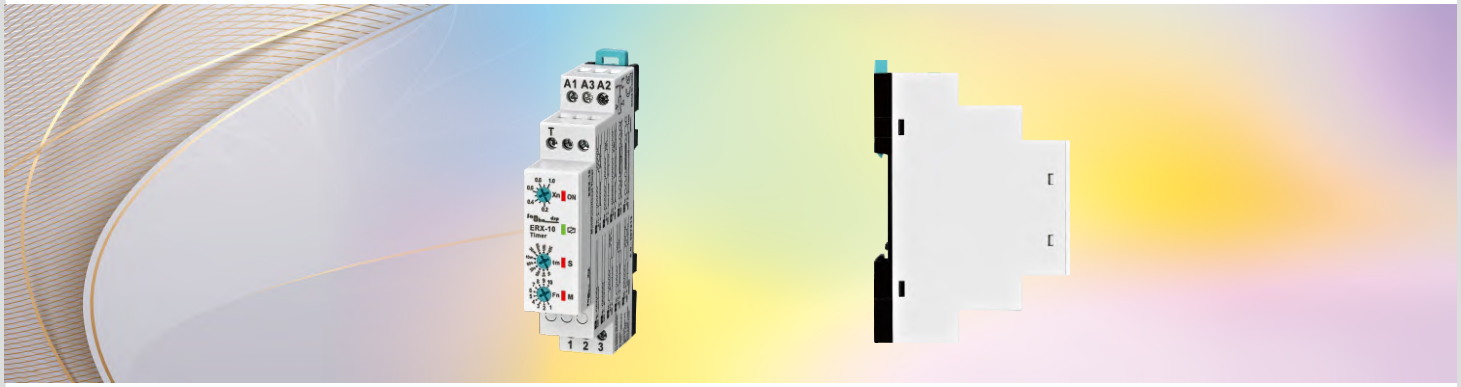
E R V - 0 9 - 2 2 0

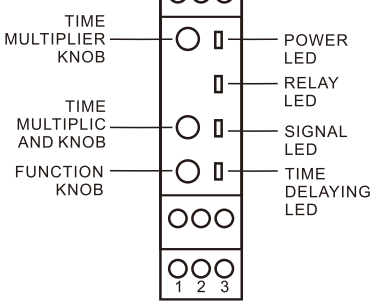
① ②

①	Model		
②	Operating Voltage	12	12V(A2-A3)
		110	110V(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)(Can be omitted)
		380	380V(A1-A2)

ERX-10

Electronic 10 Functions Time Relay





Terminal(A1-A2):POWER SUPPLY<1>
Terminal(A2-A3):POWER SUPPLY<2>
Terminal(T):TRIGGER SIGNAL
Terminal(1-2-3):RELAY OUTPUT

General Description

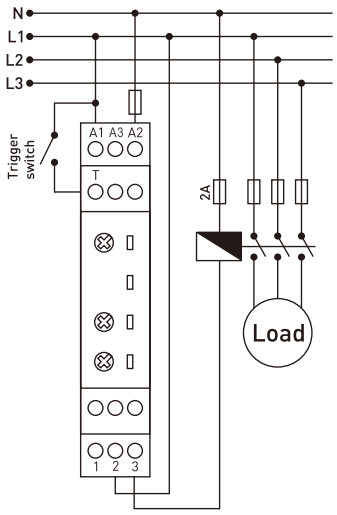
ERX-10 timer relay are used in all fields (industry,house,plant etc.)need controlls related to the time.

Function

Function Item	Approach
On Delay	-1- Function knob
Off Delay	-2- Function knob
Control On Delay	-3- Function knob
Control Off Delay	-4- Function knob
Single Shot Leading Edge With Control Input	-5- Function knob
Single Shot Trailing Edge With Control Input	-6- Function knob
On Delay And Off Delay With Control	-7- Function knob
Pulse Output With Control	-8- Function knob
Equivalent Timed Flasher(t=ton=toff)	-9- Function knob
Equivalent Timed Flasher With Control(t=ton=toff)	-10- Function knob

Electric Reset

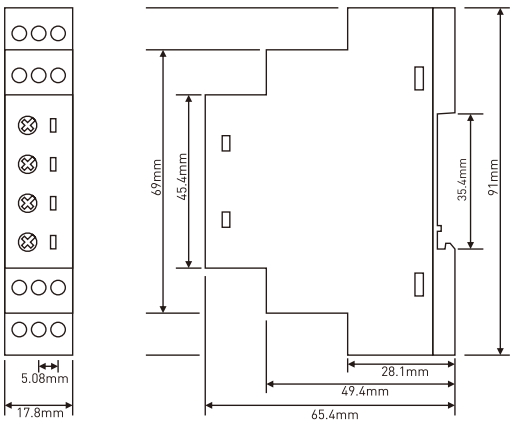
Turn off the power(A1-A2) or (A2-A3) or some functions can use “T” signal SW. Remote reset is possible to install the SW on afar.



Specifications

Time Range			0.1sec. ~ 30hours
Reset			Electric Reset
Indicator			LED
Operating Voltage	Voltage range	12	12VAC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)
		380	380VAC(A1-A2)
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<80gr.

Dimensions



Ordering

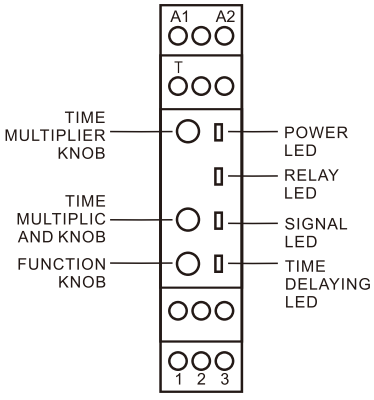
E R X - 1 0 - 1 1 0

① ②

①	Model		0.1sec. ~ 30hours
②	Operating Voltage	12	12VAC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)(Can be omitted)
		380	380VAC(A1-A2)

ERX-20

Electronic 10 Functions Time Relay (Wide Voltage:24~240VAC/DC)



Terminal(A1-A2):POWER SUPPLY<1>
Terminal(A2-A3):POWER SUPPLY<2>
Terminal(T):TRIGGER SIGNAL
Terminal(1-2-3):RELAY OUTPUT

General Description

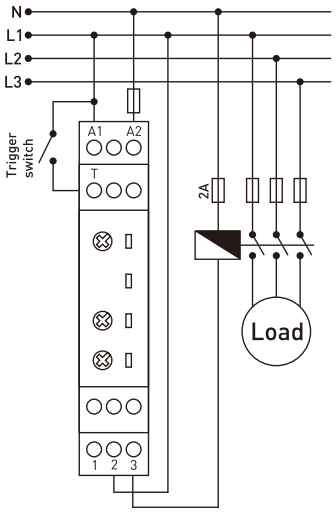
ERX-20 timer relay are used in all fields (industry,house,plant etc.)need controlls related to the time.

Function

Function Item	Approach
On Delay	-1- Function knob
Off Delay	-2- Function knob
Control On Delay	-3- Function knob
Control Off Delay	-4- Function knob
Single Shot Leading Edge With Control Input	-5- Function knob
Single Shot Trailing Edge With Control Input	-6- Function knob
On Delay And Off Delay With Control	-7- Function knob
Pulse Output With Control	-8- Function knob
Equivalent Timed Flasher(t=ton=toff)	-9- Function knob
Equivalent Timed Flasher With Control(t=ton=toff)	-10- Function knob

Electric Reset

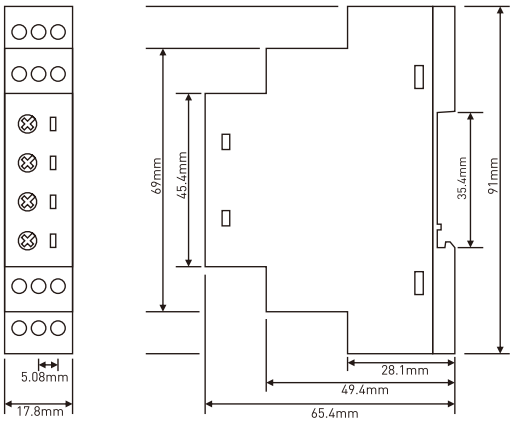
Turn off the power(A1-A2) or (A2-A3) or some functions can use “T” signal SW. Remote reset is possible to install the SW on afar.



Specifications

Time Range		0.1sec. ~ 30hours
Reset		Electric Reset
Indicator		LED
OperatingVoltage	Voltage range	12 ~ 240VAC/DC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		<80gr.

Dimensions



Ordering

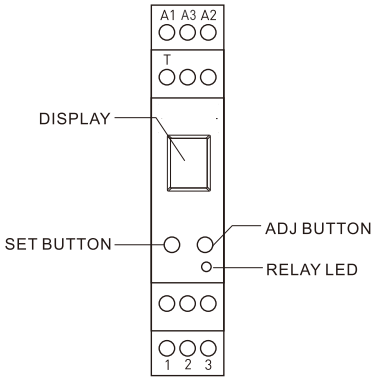
E R X - 2 0

①

①	Model	0.1sec. ~ 30hours	12 ~ 240AC/DC

MCB-10

Digital 10 Functions Time Relay



Terminal(A1-A2):POWER SUPPLY<1>
Terminal(A2-A3):POWER SUPPLY<2>
Terminal(T):TRIGGER SIGNAL
Terminal(1-2-3):RELAY OUTPUT

General Description

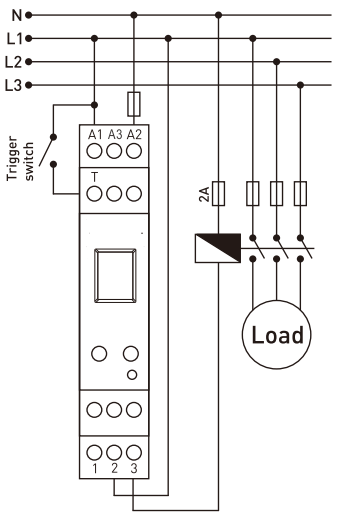
MCB-10 timer relay are used in all fields (industry,house,plant etc.)need controlls related to the time.

Function

Function Item	Approach
On Delay	-1- Function knob
Off Delay	-2- Function knob
Control On Delay	-3- Function knob
Control Off Delay	-4- Function knob
Single Shot Leading Edge With Control Input	-5- Function knob
Single Shot Trailing Edge With Control Input	-6- Function knob
On Delay And Off Delay With Control	-7- Function knob
Pulse Output With Control	-8- Function knob
Equivalent Timed Flasher(t=ton=toff)	-9- Function knob
Equivalent Timed Flasher With Control(t=ton=toff)	-10- Function knob

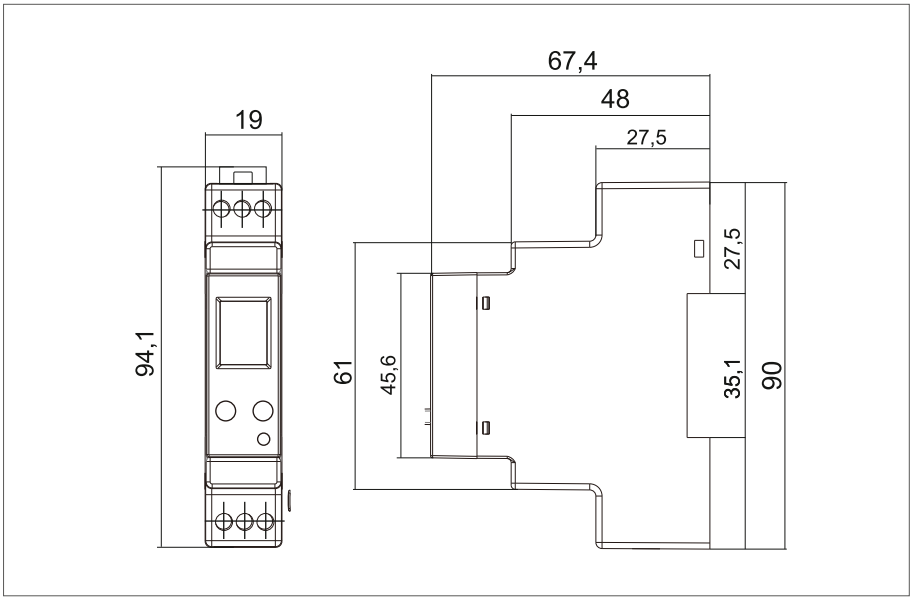
Electric Reset

Turn off the power(A1-A2) or (A2-A3) or some functions can use “T” signal SW. Remote reset is possible to install the SW on afar.



Specifications

Time Range			0.1sec. ~ 999hours
Reset			Electric Reset
Indicator			LED
Operating Voltage	Voltage range	12	12VAC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)
		380	380VAC(A1-A2)
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<90gr.



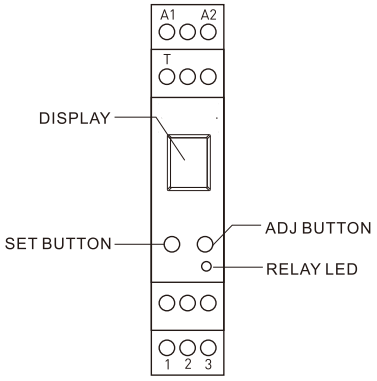
Ordering

M	C	B	-	1	0	-	1	1	0
				①			②		

①	Model		0.1sec. ~ 999hours
②	Operating Voltage	12	12VAC(A2-A3)
		110	110VAC(A1-A2),24VAC/DC(A2-A3)
		220	150 ~ 260VAC(A1-A2),24VAC/DC(A2-A3)(Can be omitted)
		380	380VAC(A1-A2)

MCB-20

Digital 10 Functions Time Relay (Wide Voltage:24~240VAC/DC)



Terminal(A1-A2):POWER SUPPLY<1>
Terminal(A2-A3):POWER SUPPLY<2>
Terminal(T):TRIGGER SIGNAL
Terminal(1-2-3):RELAY OUTPUT

General Description

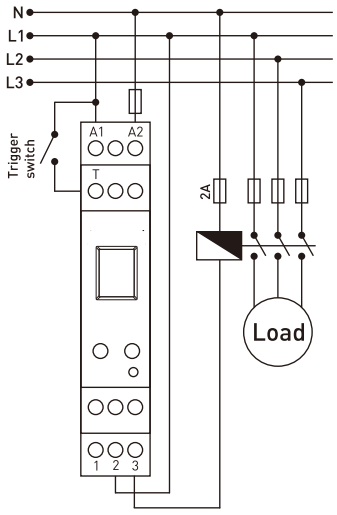
MCB-20 timer relay are used in all fields (industry,house,plant etc.)need controlls related to the time.

Function

Function Item	Approach
On Delay	-1- Function knob
Off Delay	-2- Function knob
Control On Delay	-3- Function knob
Control Off Delay	-4- Function knob
Single Shot Leading Edge With Control Input	-5- Function knob
Single Shot Trailing Edge With Control Input	-6- Function knob
On Delay And Off Delay With Control	-7- Function knob
Pulse Output With Control	-8- Function knob
Equivalent Timed Flasher(t=ton=toff)	-9- Function knob
Equivalent Timed Flasher With Control(t=ton=toff)	-10- Function knob

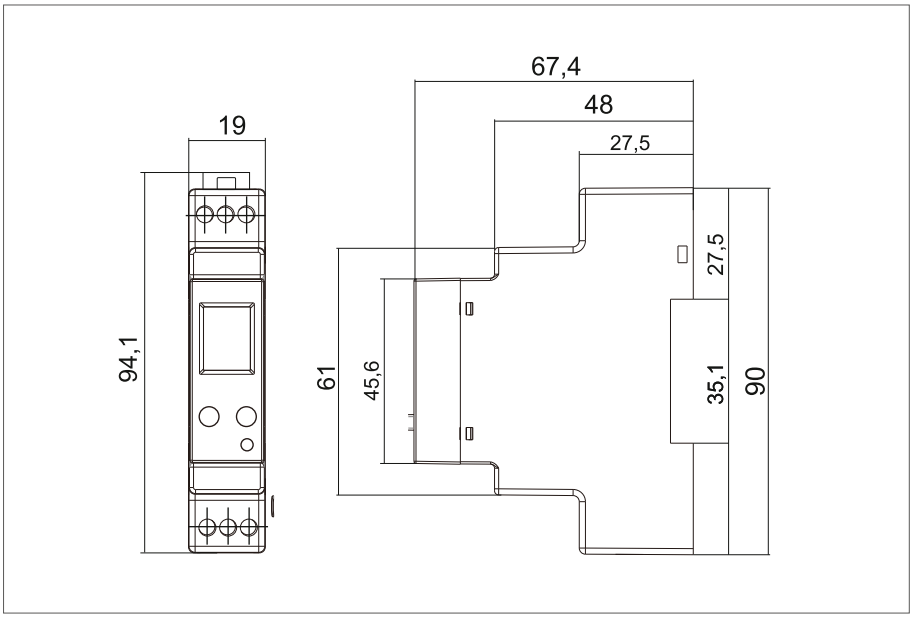
Electric Reset

Turn off the power(A1-A2) or (A2-A3) or some functions can use “T” signal SW. Remote reset is possible to install the SW on afar.

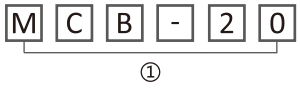


Specifications

Time Range		0.1sec. ~ 999hours
Reset		Electric Reset
Indicator		LED
OperatingVoltage	Voltage range	12 ~ 240VAC/DC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		<90gr.



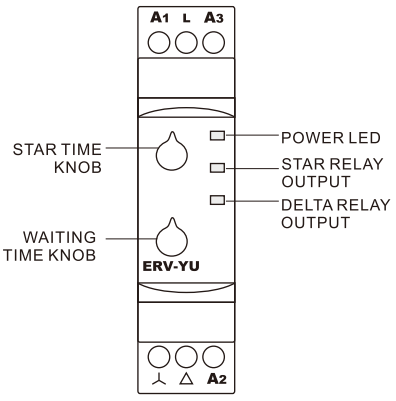
Ordering



①	Model	0.1sec. ~ 999hours	12 ~ 240AC/DC

ERV-YU

Electronic Star Delta Time Relay



Terminal(A1-A2): POWER SUPPLY
Terminal(L -人- △): STAR / DELTA RELAY OUTPUT

General Description

ERV-YU Star Delta Relay is designed to controll three phase motors in the start.

Function

Function Item	Approach
Star Delay	t Knob (sec.)
Toggle (Wait) Delay	t Knob(msec.)

Electric Reset

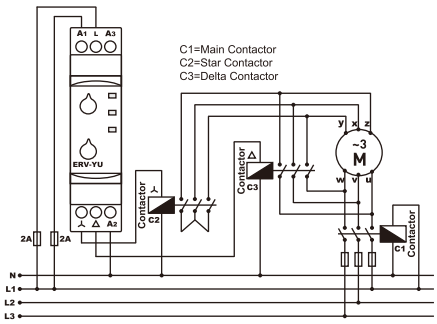
Turn off the power(A1-A2) .Remote reset is possible to install the SW on afar.

Relay output Status

When powered(run the star): L ㅓ ㅏ人 Close, L ㅓ ㅏ△ Open
When run the waiting time: L ㅓ ㅏ人 Open, L ㅓ ㅏ △ Open
When run the delta : L ㅓ ㅏ人 Open, L ㅓ ㅏ △ Close

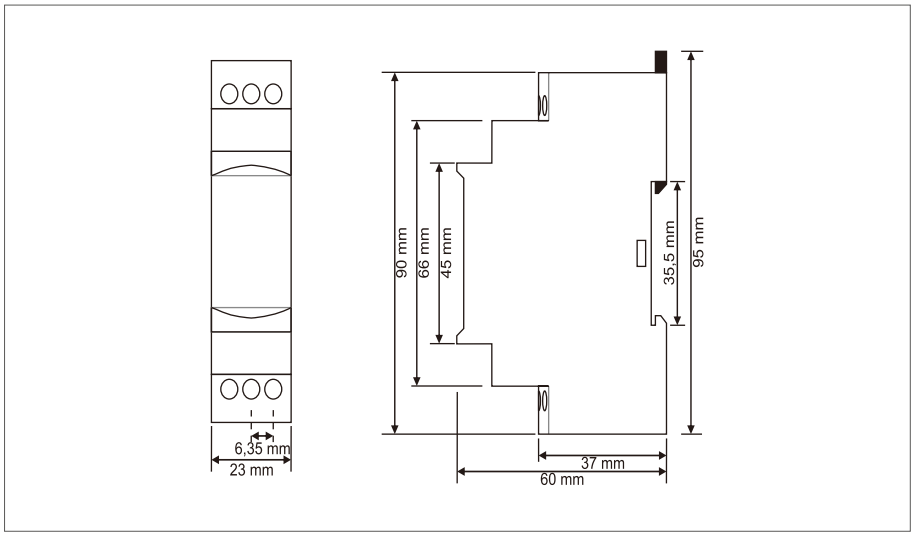
LED Indication

Condition	ON(Red)LED	人(Green)LED	△(Green)LED	Remarks
Power(Star)	○	○	×	○:ON ×:OFF
Delta	○	×	○	



Specifications

Time Range		Type	Range
		Star	0.1 ~ 30sec.
		Wait	10 ~ 500msec.
Reset			Electric Reset
Indicator			LED
Operating Voltage	Voltage range	12	12VAC
		24	24VAC/DC
		110	110VAC
		220	150 ~ 260VAC
		380	380VAC
	Frequency		50/60Hz
Output	Contact		2-SPST(2NO)
	Condition		When powered(run the star): ㄴ┤ ├人Close, ㄴ┤ ├△ Open
			When run the delta : ㄴ┤ ├人Open, ㄴ┤ ├△Close
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<90gr.



Ordering

E R V - Y U - 1 1 0

① ②

①	Model		
②	Operating Voltage	12	12VAC/DC
		24	24VAC/DC
		110	110VAC
		220	150 ~ 260VAC(Can be omitted)
		380	380VAC

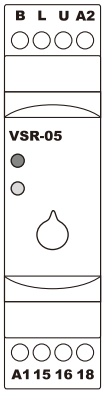
Liquid Level Relay

VSR-05
Liquid Level Relay
104/page

SSR-05
Liquid Level Relay
106/page

VSR-05

Liquid Level Relay



Terminal(A1-A2): POWER SUPPLY
Terminal(B): BOTTOM ELECTRODE
Terminal(L): LOW ELECTRODE
Terminal(U): UPPER ELECTRODE
Terminal(15-16-18):RELAY OUTPUT

General Description

Liquid level control relays has been designed for controlling the discharge of tanks and wells containing conductive liquids.

Function

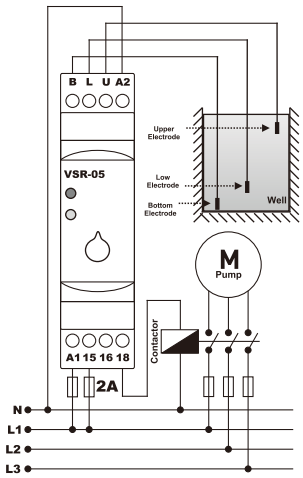
Function Item	Approach
Sensitivity Setting	5kΩ ~ 100kΩ

Relay output Status

Water level between low and bottom electrode: 15 ⊣⊢ 16 Close, 15 ⊣ ⊢ 18 Open
Water level touchs to upper electrode: 15 ⊣⊢ 16 Open, 15 ⊣ ⊢ 18 Close

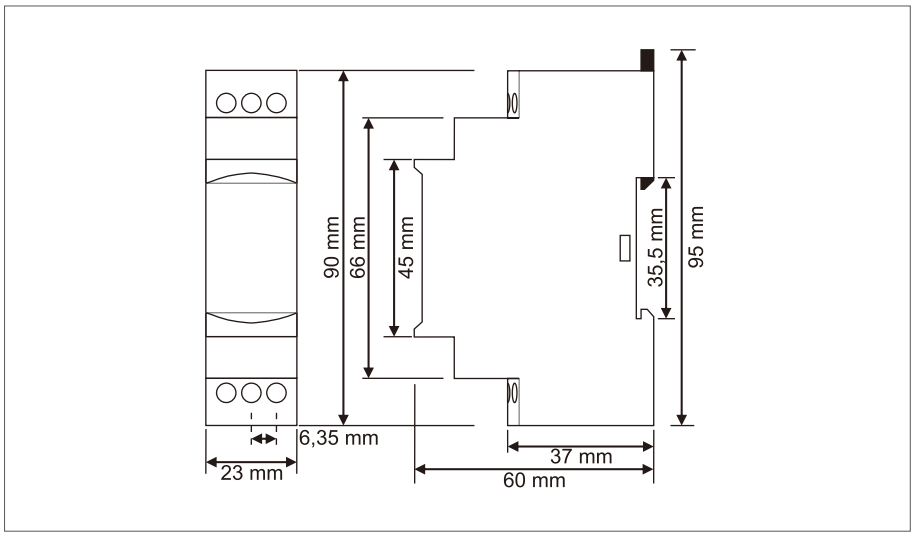
LED Indication

Condition	ON(Green)LED	Out(Red)LED	Remarks
Power	○	×	○:ON ×:OFF
Output	○	○	

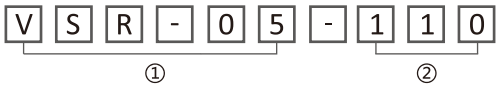


Specifications

Reset			Electric Reset
Indicator			LED
Operating Voltage	Voltage range	12	12VAC/DC
		24	24VAC/DC
		110	110VAC
		220	150 ~ 260VAC
		380	380VAC
Output	Frequency		50/60Hz
	Contact		1-SPDT(1c)
	Condition		When relay stop output: 15⊣⊢16 Close, 15⊣ ⊢18 Open
			When relay output: 15⊣⊢16 Open, 15⊣ ⊢18 Close
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<130gr.



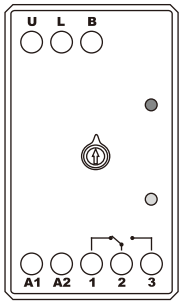
Ordering



①	Model		
②	Operating Voltage	12	12VAC/DC
		24	24VAC/DC
		110	110VAC
		220	150 ~ 260VAC(Can be omitted)
		380	380VAC(A1-A2)

SSR-05

Liquid Level Relay



Terminal(A1-A2): POWER SUPPLY
Terminal(B): BOTTOM ELECTRODE
Terminal(L): LOW ELECTRODE
Terminal(U): UPPER ELECTRODE
Terminal(1-2-3):RELAY OUTPUT

General Description

Liquid level control relays has been designed for controlling the discharge of tanks and wells containing conductive liquids.

Function

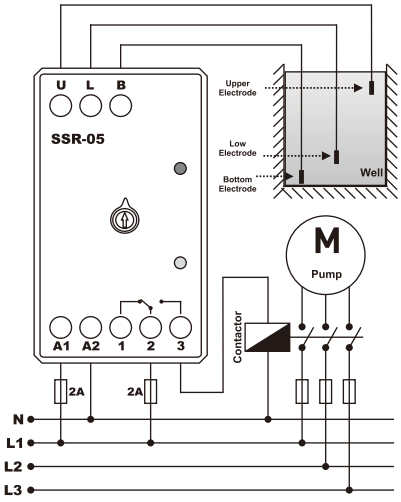
Function Item	Approach
Sensitivity Setting	5kΩ ~ 100kΩ

Relay output Status

Water level between low and bottom electrode: 15 ⊣⊢ 16 Close, 15 ⊣ ⊢ 18 Open
Water level touchs to upper electrode: 15 ⊣⊢ 16 Open, 15 ⊣ ⊢ 18 Close

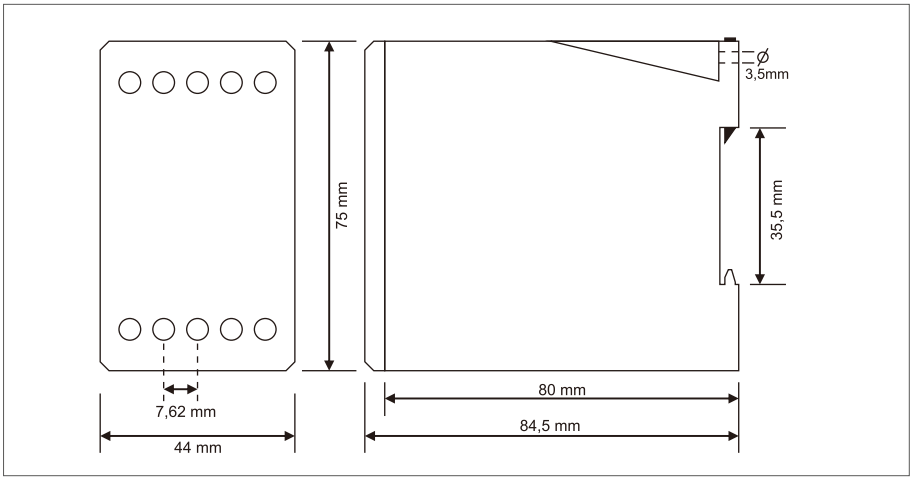
LED Indication

Condition	ON(Green)LED	Out(Red)LED	Remarks
Power	○	×	○ : ON × : OFF
Output	○	○	



Specifications

Indicator			LED
Operating Voltage	Voltage range	12	12VAC/DC
		24	24VAC/DC
		110	110VAC
		220	150 ~ 260VAC
		380	380VAC
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When relay stop output: 1⊣⊢2 Close, 2⊣ ⊢3 Open
			When relay output: 1⊣⊢2 Open, 2⊣ ⊢3 Close
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<230gr.



Ordering

S	S	R	-	0	5	-	1	1	0
①							②		

①	Model		
②	Operating Voltage	12	12VAC/DC
		24	24VAC/DC
		110	110VAC
		220	150 ~ 260VAC(Can be omitted)
		380	380VAC

Overload Relay

SOPR-SS1
Electronic Overload Relay
110page

SOPR-SS2
Electronic Overload Relay
112/page

SOPR-SS3
Electronic Overload Relay
114/page

SOPR-SP
Electronic Overload Relay
116/page

EOCR-DS(Easy Type)(1c)
Electronic Overload Relay
126/page

EOCR-DS(Standard Type)(1a1b)
Electronic Overload Relay
128/page

EOCRSS(Standard Type)
Electronic Overload Relay
130/page

EOCRSS(Premium Type)
Electronic Overload Relay
132/page

EOCRAR
Electronic Automatic Reset Overload Relay
142/page

AKR-03D
Electronic Auto-Reset Overload Relay
144/page

AKR-XXD
Electronic Auto-Reset Overload Relay(Included C.T)
146/page

DAKR-03D
Digital Auto-Reset Overload Relay
148/page

SOPR-EP
Electronic Overload Relay
118/page

SOPR-3DE
Electronic Overload Relay
120/page

EOCR-SS(Easy Type)
Electronic Overload Relay
122/page

EOCR-SE2(Easy Type)
Electronic Overload Relay
124/page

EOCRSE2(Standard Type)
Electronic Overload Relay
134/page

EOCRDS3(Standard Type)
Electronic Overload Relay
136/page

EOCRDS3(Premium Type)(1a1b)
Electronic Overload Relay
138/page

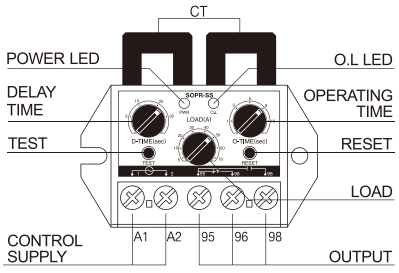
EOCRSSD
Digtal Over-current Relay
140/page

DAKR-XXD
Digital Auto-Reset Overload Relay(Included C.T)
150/page

TRM
Digital Manual/Auto Reset Overload Relay
152/page

SOPR-SS1

Electronic Overload Relay



General Description

SOPR-SS1 Electronic overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Operating (Trip) Time
Overload	O-TIME
Phase Loss	O-TIME
Locked Rotor	O-TIME + D-TIME

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Delay Time	D-TIME	Set two to three seconds Inger than the motor starting time.
Operating Time	O-TIME	Over-current run time.Set less than the motor's endurance time with over-current.
Rated Current	Load	Set over 110% of the motor's rated current of under 120% of its operating current

Manual / Electric Reset

Press the RESET button or turn off the power (L1, L2) -. Remote Reset is possible to install the SW on afar.

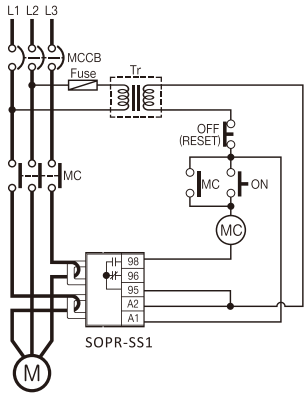
TEST Instruction

With test button hold down,the red LED is on and the product will trip after D-TIME+O-TIME.
The relay will be de-energized when RESET button is pushed or the control power is disconnected.

LED Indication

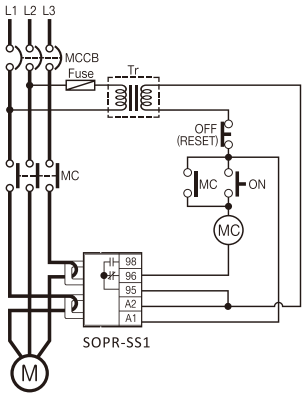
Condition	PWR(Green)LED	Trip(Red)LED	Remarks
Power	○	×	○:ON ×:OFF
Normal Running	○	×	
Trip	×	○	

N-Type(Safer than type R)



※ For N-type model,with control power on
95 ⊣⊢ 96 is Open,
95 ⊣ ⊢ 98 is Closed

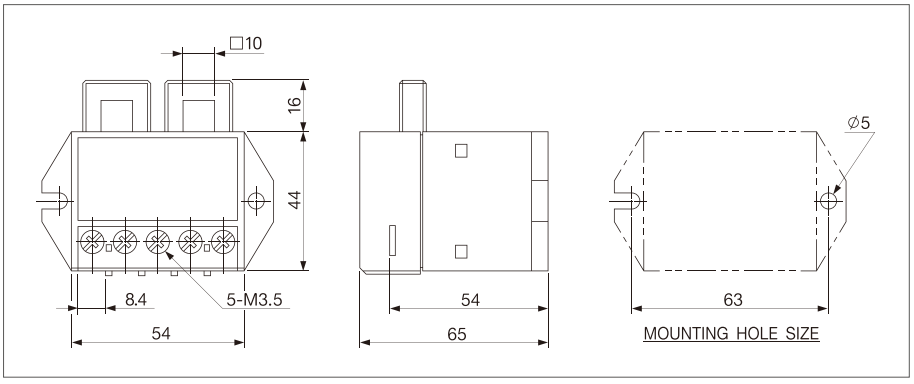
R-Type



※ For R-type model,with control power on
95 ⊣⊢ 96 is Closed,
95 ⊣ ⊢ 98 is Open

Specifications

Current Setting		Type	Range
		05	0.5 ~ 6.5A
		30	3 ~ 35A
		60	5 ~ 70A
TIME	Starting	D-TIME	0.2 ~ 30 sec
	Operation	O-TIME	0.2 ~ 10 sec
Reset			Manual / Electric Reset
Indicator			LED
Accuracy		Current	±10%
		Time	±15%
Control Voltage	Voltage Range	24	AC/DC 24V
		110	AC 110V
		220	AC 90 ~ 260V
		440	AC180 ~ 460V
	Frequency		50/60Hz
Output	Contact		1-SPDT (1C)
	Condition	N Type	When powered, 95⊣⊢96 Open, 95⊣ ⊢98 Close
		R Type	When powered, 95⊣⊢96 Close ,95⊣ ⊢98 Open
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55°C
Mounting			35mm DIN-Rail / Panel
Weight			<170gr.



Ordering

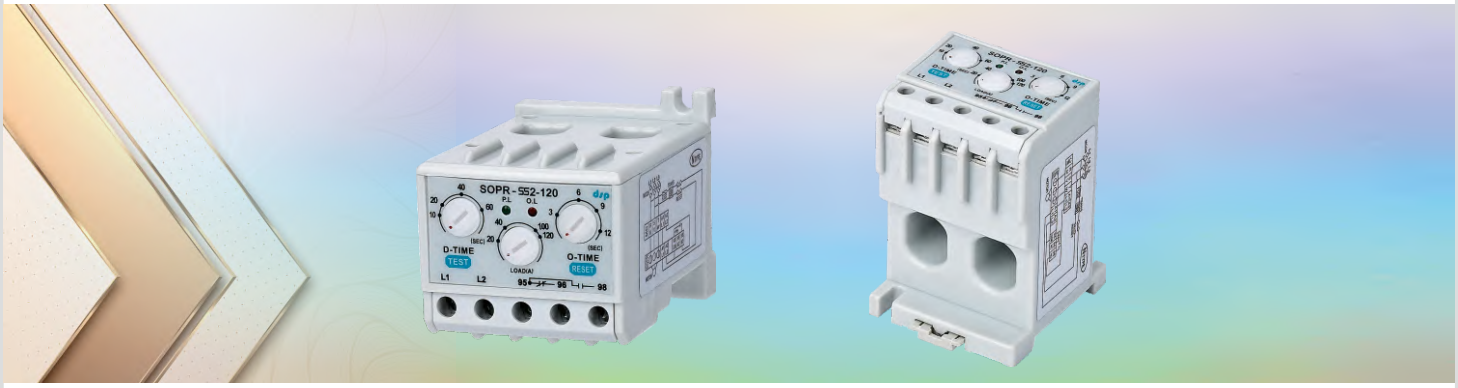
S O P R - S S 1 - 0 5 - N 4 4 0

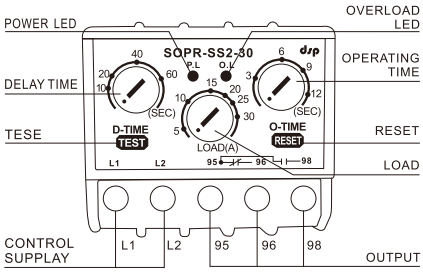
① ② ③ ④

①	Model		
②	Current	05	0.5 ~ 6.5A
		30	3 ~ 35A
		60	5 ~ 70A
③	Condition	N	Normal Energized
		R	Normal De-energized
④	Control Voltage	24	AC/DC 24V, 50/60Hz
		110	AC110V, 50/60Hz
		220	AC90 ~ 260V,50/60Hz
		440	AC180 ~ 460V,50/60Hz

SOPR-SS2

Electronic Overload Relay





General Description

SOPR-SS2 Electronic overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Operating (Trip) Time
Overload	O-TIME
Phase Loss	O-TIME
Locked Rotor	O-TIME + D-TIME

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Delay Time	D-TIME	Set two to three seconds Inger than the motor starting time.
Operating Time	O-TIME	Over-current run time.Set less than the motor's endurance time with over-current.
Rated Current	Load	Set over 110% of the motor's rated current of under 120% of its operating current

Manual / Electric Reset

Press the RESET button or turn off the power (L1, L2) -. Remote Reset is possible to install the SW on afar.

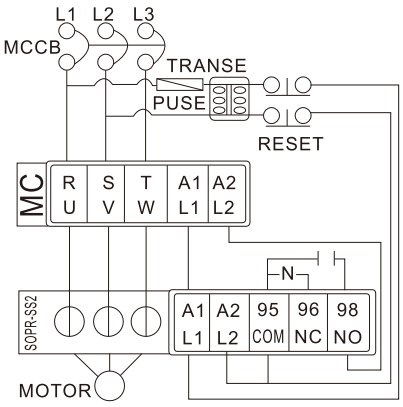
TEST Instruction

With test button hold down,the red LED is on and the product will trip after D-TIME+O-TIME.
The relay will be de-energized when RESET button is pushed or the control power is disconnected.

LED Indication

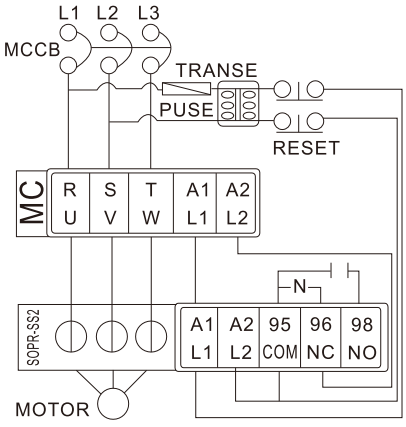
Condition	PWR(Green)LED	Trip(Red)LED	Remarks
Power	○	×	○:ON ×:OFF
Normal Running	○	×	
Trip	×	○	

N-Type(Safer than type R)



※ For N-type model,with control power on
95 ⫤⊢ 96 is Open,
95 ⫞⊢ 98 is Closed

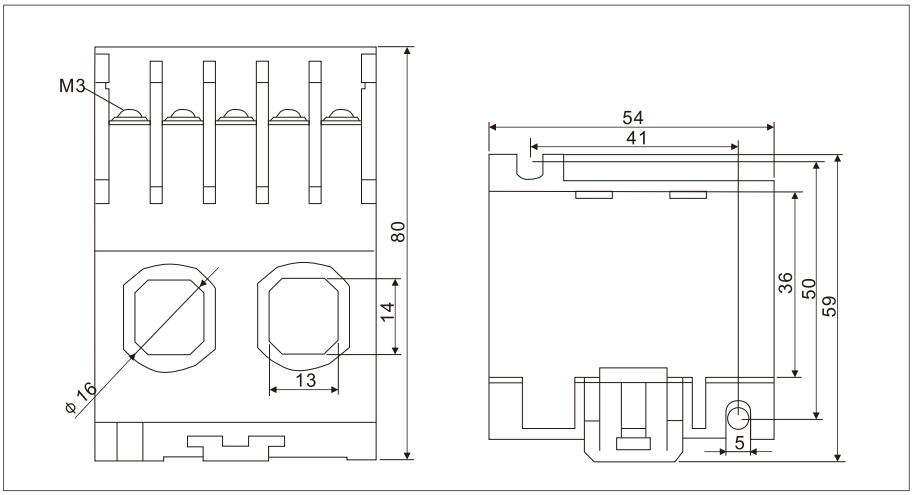
R-Type



※ For R-type model,with control power on
95 ⫤⊢ 96 is Closed,
95 ⫞⊢ 98 is Open

Specifications

		Type	Range
Current Setting		06	1 ~ 6A
		30	5 ~ 30A
		60	5 ~ 60A
		120	10 ~ 120A
Time	Starting	D-TIME	0.2 ~ 60 sec
	Operation	O-TIME	0.2 ~ 12 sec
Reset			Manual / Electric Reset
Accuracy		Current	±10%
		Time	±15%
Control Voltage	Voltage range	24	AC/DC 24V
		110	AC 110V
		220	AC 90 ~ 260V
		440	AC180 ~ 460V
	Frequency		50/60Hz
Output	Contact		1-SPDT (1C)
	Condition	N Type	When powered, 95⫤⊢96 Open, 95⫞⊢98 Close
		R Type	When powered, 95⫤⊢96 Close ,95⫞⊢98 Open
	Contacts		5A/250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail / Panel
Weight			<150gr.



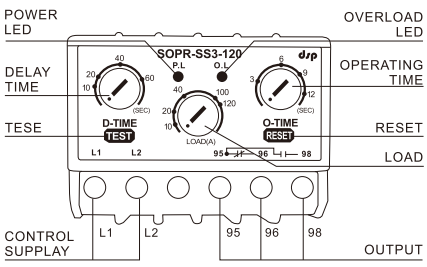
Ordering

S O P R - S S 2 - 6 0 - N 4 4 0
① ② ③ ④

①	Model		
②	Current	05	1 ~ 6A
		30	5 ~ 30A
		60	5 ~ 60A
		120	10 ~ 120A
③	Condition	N	Normal Energized
		R	Normal De-energized
④	Power Supply	24	24VAC/DC, 50/60Hz
		110	110VAC, 50/60Hz
		220	AC90 ~ 260V,50/60Hz
		440	AC180 ~ 460V,50/60Hz

SOPR-SS3

Electronic Overload Relay



General Description

SOPR-SS3 Electronic overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Operating (Trip) Time
Overload	O-TIME
Phase Loss	O-TIME
Locked Rotor	O-TIME + D-TIME

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Delay Time	D-TIME	Set two to three seconds Inger than the motor starting time.
Operating Time	O-TIME	Over-current run time.Set less than the motor's endurance time with over-current.
Rated Current	Load	Set over 110% of the motor's rated current of under 120% of its operating current

Manual / Electric Reset

Press the RESET button or turn off the power (L1, L2) -. Remote Reset is possible to install the SW on afar.

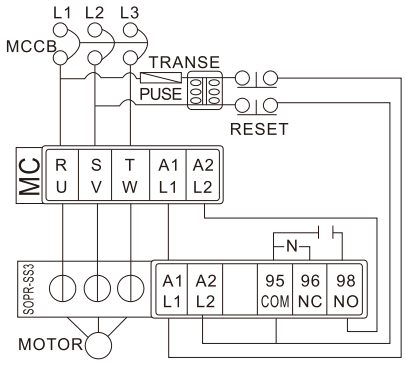
TEST Instruction

With test button hold down,the red LED is on and the product will trip after O-TIME.
The relay will be de-energized when RESET button is pushed or the control power is disconnected.

LED Indication

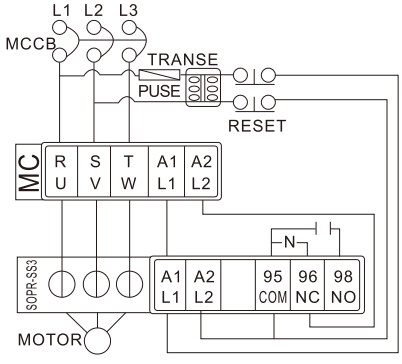
Condition	PWR(Green)LED	Trip(Red)LED	Remarks
Power	○	×	○:ON ×:OFF
Normal Running	○	×	
Trip	×	○	

N-Type(Safer than type R)



※ For N-type model,with control power on
95 ⫽ 96 is Open,
95 ┤├ 98 is Closed

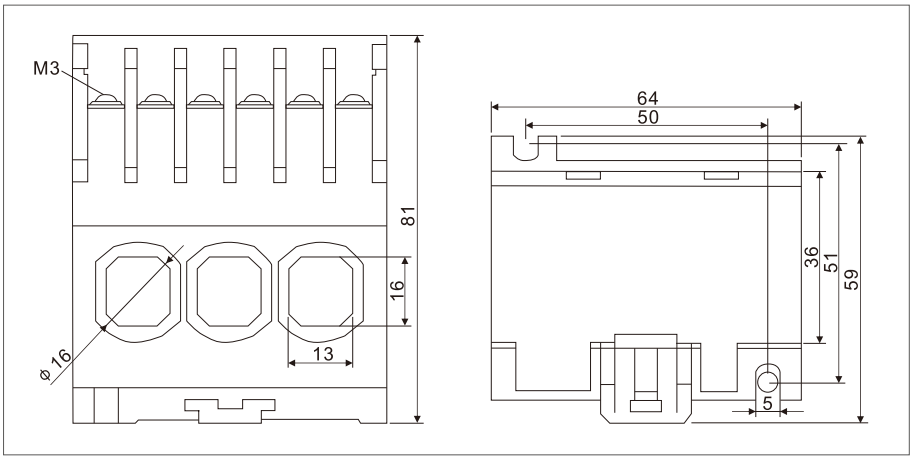
R-Type



※ For R-type model,with control power on
95 ⫽ 96 is Closed,
95 ┤├ 98 is Open

Specifications

Current Setting		Type	Range
		06	1 ~ 6A
		30	5 ~ 30A
		60	5 ~ 60A
		120	10 ~ 120A
Time	Starting	D-TIME	0.2 ~ 60 sec
	Operation	O-TIME	0.2 ~ 12 sec
Reset			Manual / Electric Reset
Accuracy		Current	±10%
		Time	±15%
Control Voltage	Voltage range	24	AC/DC 24V
		110	AC 110V
		220	AC 90 ~ 260V
		440	AC180 ~ 460V
	Frequency		50/60Hz
Output	Contact		1-SPDT (1C)
	Condition	N Type	When powered, 95⫽96 Open, 95┤├98 Close
		R Type	When powered, 95⫽96 Close ,95┤├98 Open
	Contacts		5A/250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail / Panel
Weight			<160gr.



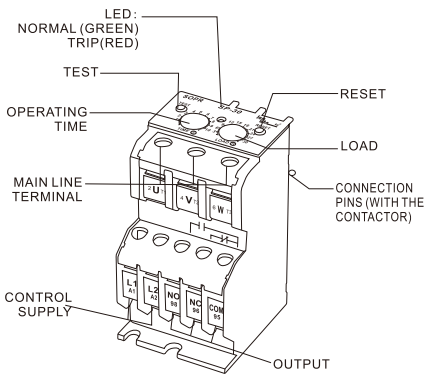
Ordering

S O P R - S S 3 - 6 0 - N 4 4 0
① ② ③ ④

①	Model		
②	Current	05	1 ~ 6A
		30	5 ~ 30A
		60	5 ~ 60A
		120	10 ~ 120A
③	Condition	N	Normal Energized
		R	Normal De-energized
④	Power Supply	24	24VAC/DC, 50/60Hz
		110	110VAC, 50/60Hz
		220	AC 90 ~ 260V, 50/60Hz
		440	AC180 ~ 460V, 50/60Hz

SOPR-SP

Electronic Overload Relay



General Description

SOPR-SP Electronic overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Operating (Trip) Time
Overload	TIME
Phase Loss	TIME
Locked Rotor	TIME

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Delay Time Operating Time	TIME	Total time of startup delay and failure delay.
Rated Current	Load	Set over 110% of the motor's rated current of under 120% of its operating current

Manual / Electric Reset

Press the RESET button or turn off the power (L1, L2) -. Remote Reset is possible to install the switch on afar.

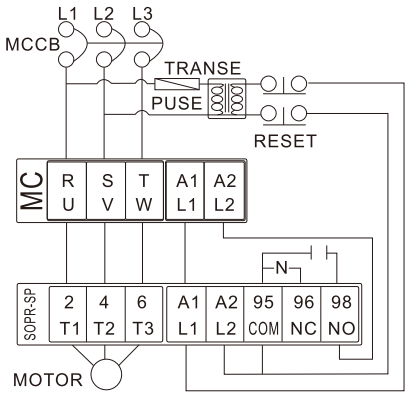
TEST Instruction

With test button hold down,the red LED is on and the product will trip after TIME.
The relay will be de-energized when RESET button is pushed or the control power is disconnected.

LED Indication

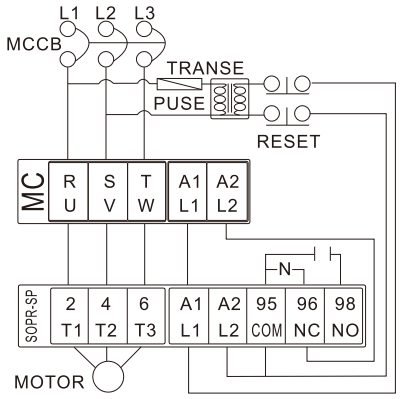
Condition	Green LED	Red LED	Remarks
Power	○	×	○:ON ×:OFF
Normal Running	○	×	
Trip	×	○	

N-Type(Safer than type R)



※ For N-type model,with control power on
95 ⊀ 96 is Open,
95 ┤├ 98 is Closed

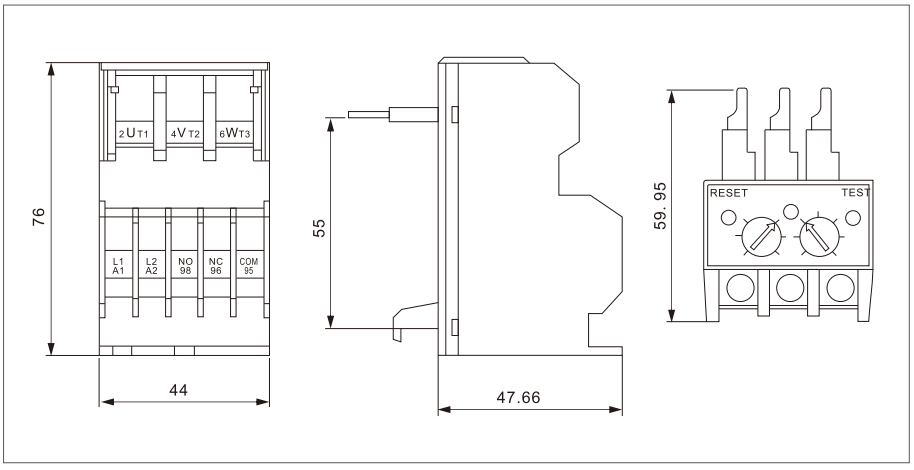
R-Type



※ For R-type model,with control power on
95 ⊀ 96 is Closed,
95 ┤├ 98 is Open

Specifications

Current Setting		Type	Range
		10	1 ~ 10A
		30	3 ~ 30A
TIME			0.2 ~ 10 sec
Reset			Manual / Electric Reset
Indicator			LED
Accuracy		Current	±10%
		Time	±15%
Control Voltage	Voltage Range	24	AC/DC 24V
		110	AC110V
		220	AC 90 ~ 260V
		440	AC180 ~ 460V
	Frequency		50/60Hz
Output	Contact		1-SPDT (1C)
	Condition	N Type	When powered, 95⊀96 Open, 95┤├98 Close
		R Type	When powered, 95⊀96 Close ,95┤├98 Open
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail / Panel
Weight			<150gr.



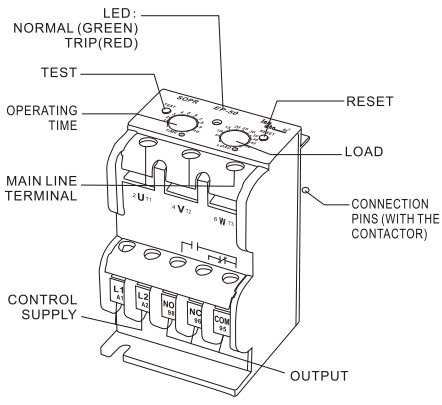
Ordering

S O P R - S P - 1 0 - N 4 4 0
① ② ③ ④

①	Model		
②	Current	10	1 ~ 10A
		30	3 ~ 30A
③	Condition	N	Normal Energized
		R	Normal De-energized
④	Control Voltage	24	AC/DC24V,50/60Hz
		110	AC110V,50/60Hz
		220	AC 90 ~ 260V, 50/60Hz
		440	AC180 ~ 460V, 50/60Hz

SOPR-EP

Electronic Overload Relay



General Description

SOPR-EP Electronic overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Operating (Trip) Time
Overload	TIME
Phase Loss	TIME
Locked Rotor	TIME

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Delay Time Operating Time	TIME	Total time of startup delay and failure delay.
Rated Current	Load	Set over 110% of the motor's rated current of under 120% of its operating current

Manual / Electric Reset

Press the RESET button or turn off the power (L1, L2) -. Remote Reset is possible to install the switch on afar.

TEST Instruction

With test button hold down,the red LED is on and the product will trip after TIME.
The relay will be de-energized when RESET button is pushed or the control power is disconnected.

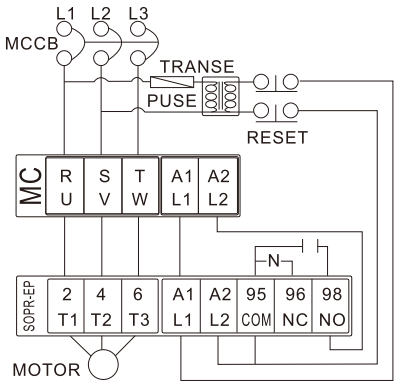
LED Indication

Condition	Green LED	Red LED	Remarks
Power	○	×	○:ON ×:OFF
Normal Running	○	×	
Trip	×	○	

Specifications

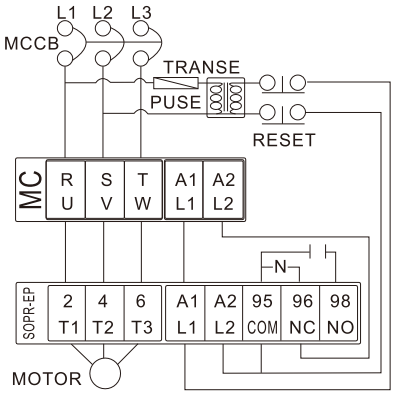
Current Setting		Type	Range
		01	0.1 ~ 1.4A
		06	0.5 ~ 6.5A
		30	3 ~ 30A
		50	10 ~ 50A
TIME			0.2 ~ 10 sec
Reset			Manual / Electric Reset
Indicator			LED
Accuracy		Current	±10%
		Time	±15%
Control Voltage	Voltage Range	24	AC/DC 24V
		110	AC110V
		220	AC 90 ~ 260V
		440	AC180 ~ 460V
	Frequency		50/60Hz
Output	Contact		1-SPDT (1C)
	Condition	N Type	When powered, 95 ⊣⊢ 96 Open, 95 ⊣ ⊢ 98 Close
		R Type	When powered, 95 ⊣⊢ 96 Close ,95 ⊣ ⊢ 98 Open
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55°C
Mounting			35mm DIN-Rail / Panel
Weight			<180gr.

N-Type(Safer than type R)

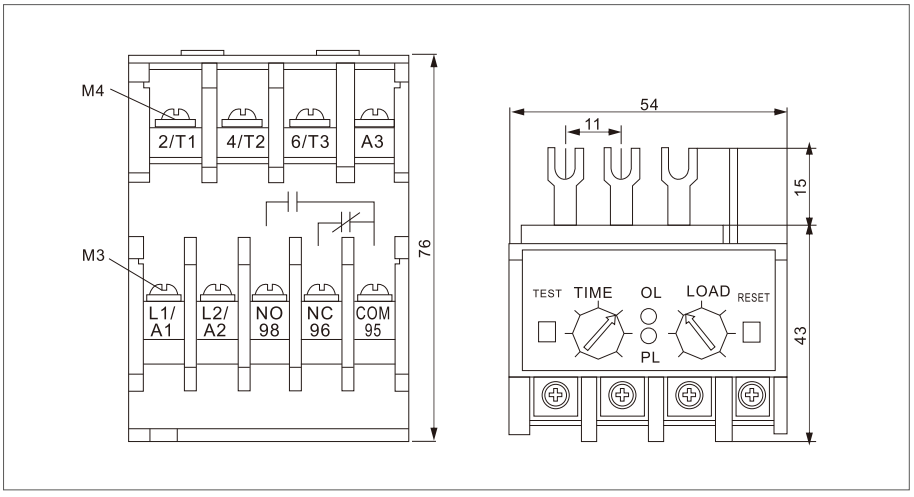


For N-type model,with control power on
95 ⊣⊢ 96 is Open,
95 ⊣ ⊢ 98 is Closed

R-Type



※ For R-type model,with control power on
95 ⊣⊢ 96 is Closed,
95 ⊣ ⊢ 98 is Open



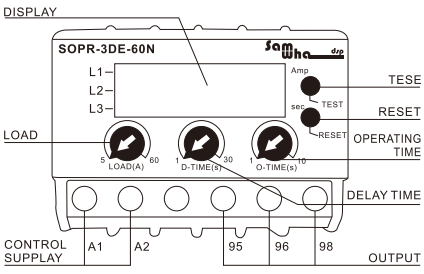
Ordering

S	O	P	R	-	E	P	-	0	6	-	N	4	4	0
①								②			③	④		

①	Model		
②	Current	01	0.1 ~ 1.4A
		06	0.5 ~ 6.5A
		30	3 ~ 30A
		50	10 ~ 50A
③	Condition	N	Normal Energized
		R	Normal De-energized
④	Control Voltage	24	AC/DC24V, 50/60Hz
		110	AC110V, 50/60Hz
		220	AC 90 ~ 260V, 50/60Hz
		440	AC180 ~ 460V, 50/60Hz

SOPR-3DE

Digital Overload Relay



General Description

SOPR-3DE Digital overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Operating (Trip) Time
Overload	O-TIME
Phase Loss	After D-TIME
Locked Rotor	O-TIME + 3 sec. (Fixed)

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Delay Time	D-TIME	Set two to three seconds lnger than the motor starting time.
Operating Time	O-TIME	Over-current run time.Set less than the motor's endurance time with over-current.
Rated Current	Load	Set over 110% of the motor's rated current of under 120% of its operating current

Manual / Electric Reset

Press the RESET button or turn off the power (L1, L2) -. Remote Reset is possible to install the SW on afar.

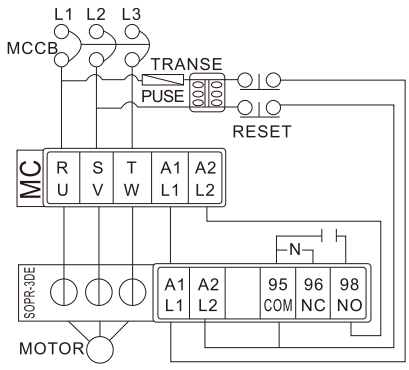
Trip Cause Indication

o 10.0	Over Current (oc)	Tripped with 10A over-current
PL-1	Phase Loss(PL)	Tripped by phase loss on L1
PL-2		Tripped by phase loss on L2
PL-3		Tripped by phase loss on L3
-Lc-	stall at starting	Tripped by stall while starting

Configuration Menu

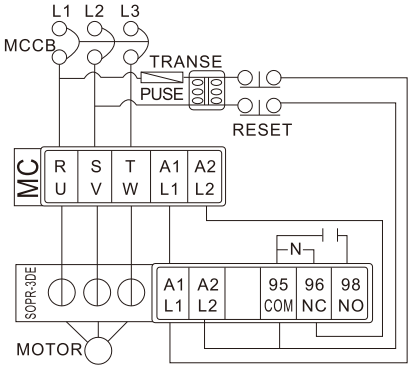
MODE	Description	Range	Remark
c 30	Over current threshold	05 Type: 0.5A ~ 6A 30 Type: 3A ~ 30A 60 Type: 10A ~ 60A	0.5 ~ 6A : 0.1A steps 3~30A: 1A steps 10~60 A: 1A steps
d 10	Starting delay time	1~30 sec	1sec steps
o 10	Over current duration	1~10 sec	1sec steps
TEST End	Test	Display"END" after elapsing 3 sec + preset O-Time Test is Not applicable under normal operation Operation time = 3 sec + O-Time	

N-Type(Safer than type R)



For N-type model,with control power on
95 ⊣⊢ 96 is Open,
95 ⊣ ⊢ 98 is Closed

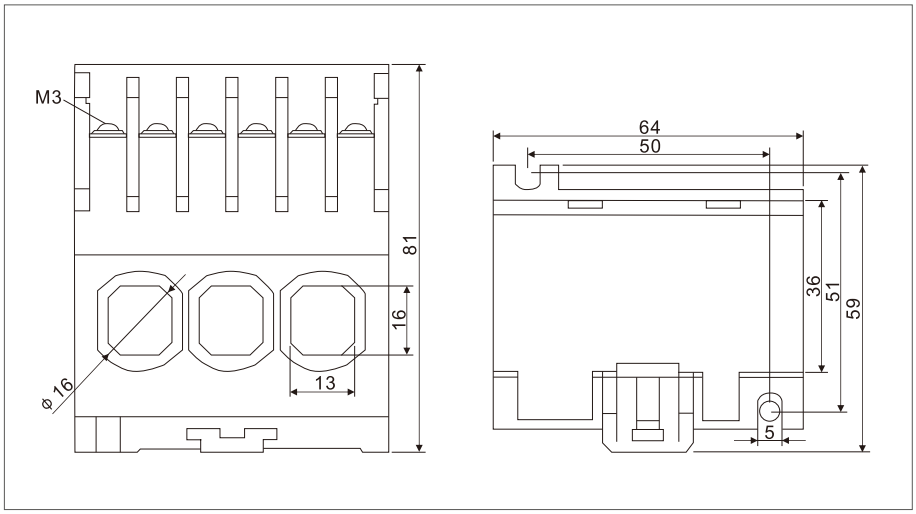
R-Type



※ For R-type model,with control power on
95 ⊣⊢ 96 is Closed,
95 ⊣ ⊢ 98 is Open

Specifications

Current Setting		Type	Range
		06	0.5 ~ 6A
		30	5 ~ 30A
		60	5 ~ 60A
		120	10 ~ 120A
Time	Starting	D-TIME	1 ~ 30 sec
	Operation	O-TIME	1 ~ 10 sec
Reset			Manual / Electric Reset
Accuracy		Current	±1%
		Time	±1%
Control Voltage	Voltage range	24	AC/DC 24V
		220	AC 90 ~ 260V
	Frequency		50/60Hz
Output	Contact		1-SPDT (1C)
	Condition	N Type	When powered, 95⊣⊢96 Open, 95⊣ ⊢98 Close
		R Type	When powered, 95⊣⊢96 Close ,95⊣ ⊢98 Open
	Contacts		5A/250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail / Panel
Weight			<180gr.



Ordering

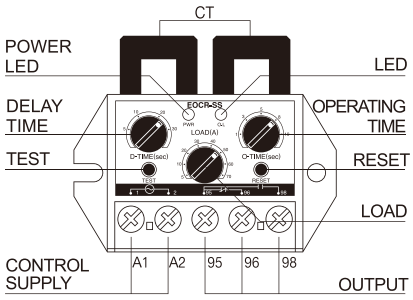
S O P R - 3 D E - 6 0 - N 2 2 0

① ② ③ ④

①	Model		
②	Current	05	1 ~ 6A
		30	5 ~ 30A
		60	5 ~ 60A
		120	10 ~ 120A
③	Condition	N	Normal Energized
		R	Normal De-energized
④	Power Supply	24	24VAC/DC,50/60Hz
		220	AC 90 ~ 260V, 50/60Hz

EOCR-SS(Easy Type)

Electronic Overload Relay



General Description

EOCR-SS(Easy type) Electronic overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Operating (Trip) Time
Overload	O-TIME
Phase Loss	O-TIME
Locked Rotor	O-TIME+D-TIME

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Delay Time	D-TIME	Set two to three seconds Inger than the motor starting time.
Operating Time	O-TIME	Over-current run time.Set less than the motor's endurance time with over-current.
Rated Current	Load	Set over 110% of the motor's rated current of under 120% of its operating current

Manual / Electric Reset

Press the RESET button or turn off the power (A1,A2)-.Remote Reset is possible to install the SW on afar.

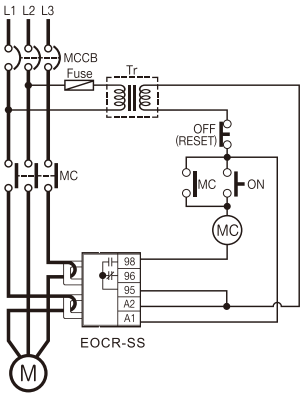
TEST Instruction

With test button hold down,the red LED is on and the product will trip after O-TIME.
The relay will be de-energized when RESET button is pushed or the control power is disconnected.

LED Indication

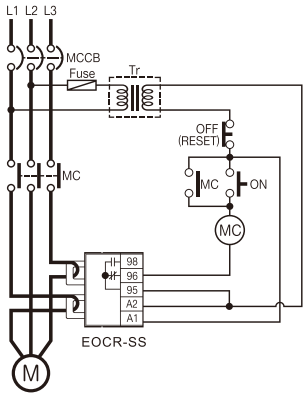
Condition	PWR(Green)LED	Trip(Red)LED	Remarks
Power	○	×	○:ON ×:OFF
Normal Running	○	×	
Trip	×	○	

N-Type(Safer than type R)



※ For N-type model,with control power on
95 ⫤⊢ 96 is Open,
95 ⫞ ⊢ 98 is Closed

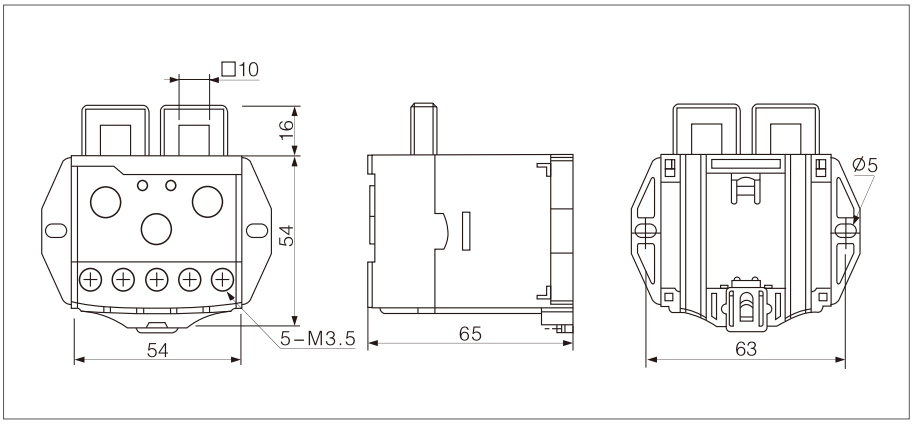
R-Type



※ For R-type model,with control power on
95 ⫤⊢ 96 is Closed,
95 ⫞ ⊢ 98 is Open

Specifications

Current Setting		Type	Range
		05	0.5 ~ 6.5A
		30	3 ~ 35A
		60	5 ~ 70A
TIME	Starting	D-TIME	0.2 ~ 30 sec
	Operation	O-TIME	0.2 ~ 10 sec
Reset			Manual / Electric Reset
Indicator			LED
Accuracy		Current	±10%
		Time	±15%
Control Voltage	Voltage Range	24	AC/DC 24V
		110	AC 110V
		220	AC 90 ~ 260V
		440	AC180 ~ 460V
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition	N Type	When powered, 95⫤⊢96 Open, 95⫞⊢98 Close
		R Type	When powered, 95⫤⊢96 Close ,95⫞⊢98 Open
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55°C
Mounting			35mm DIN-Rail / Panel
Weight			<160gr.



Ordering

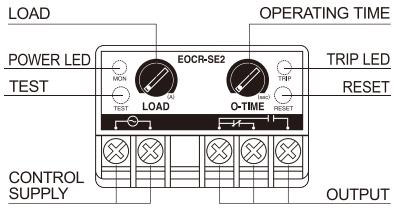
E O C R - S S - E 0 5 - N 2 2 0

① ② ③ ④ ⑤

①	Model		
②	Easy Type		
③	Current	05	0.5 ~ 6.5A
		30	3 ~ 35A
		60	5 ~ 70A
④	Condition	N	Normal Energized
		R	Normal De-energized
⑤	Power Supply	24	AC/DC 24V,50/60Hz
		110	AC110V,50/60Hz
		220	AC 90 ~ 260V, 50/60Hz
		440	AC180 ~ 460V, 50/60Hz

EOCR-SE2(Easy Type)

Electronic Overload Relay



General Description

EOCR-SE2 (Easy type) Electronic overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Operating (Trip) Time
Overload	O-TIME
Phase Loss	O-TIME
Locked Rotor	O-TIME

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Operating Time	O-TIME	Over-current run time.Set less than the motor's endurance time with over-current.
Rated Current	Load	Set over 110% of the motor's rated current of under 120% of its operating current

Manual / Electric Reset

Press the RESET button or turn off the power (A1,A2)-.Remote Reset is possible to install the SW on afar.

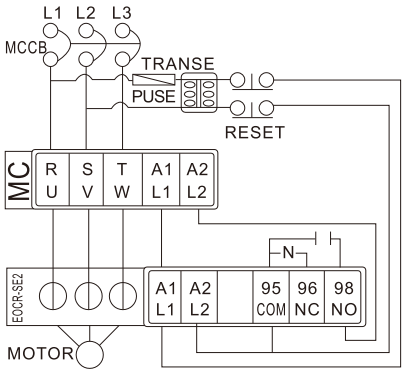
TEST Instruction

With test button hold down,the red LED is on and the product will trip after O-TIME.
The relay will be de-energized when RESET button is pushed or the control power is disconnected.

LED Indication

Condition	PWR(Green)LED	Trip(Red)LED	Remarks
Power	○	×	○:ON ×:OFF
Normal Running	○	×	
Trip	×	○	

N-Type(Safer than type R)

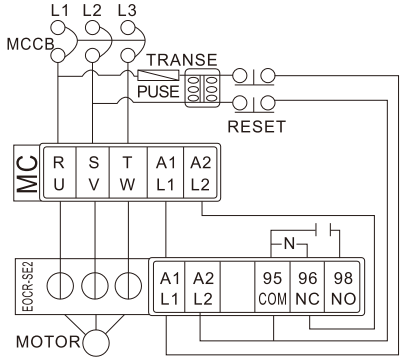


※ For N-type model,with control power on
95 ⫽ 96 is Open,
95 ┤├ 98 is Closed

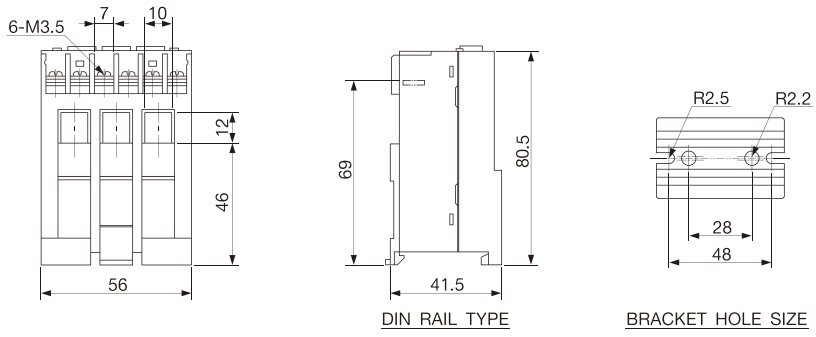
Specifications

Current Setting		Type	Range
		05	0.5 ~ 6.5A
		30	3 ~ 35A
		60	5 ~ 70A
		120	10 ~ 120A
Time	Operation	O-TIME	0.2~15 sec
Reset			Manual / Electric Reset
Indicator			LED
Control Voltage	Voltage Range	24	AC/DC 24V
		110	AC 110V
		220	AC 90 ~ 260V
		440	AC 180 ~ 460V
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition	N Type	When powered, 95⫽96 Open, 95┤├98 Close
		R Type	When powered, 95⫽96 Close ,95┤├98 Open
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Mounting			35mm DIN-Rail / Panel
Weight			<120gr.

R-Type



※ For R-type model,with control power on
95 ⫽ 96 is Closed,
95 ┤├ 98 is Open



Ordering

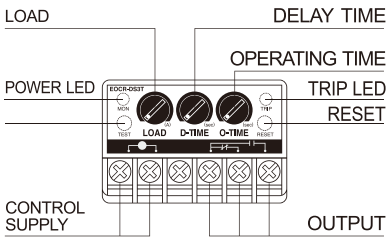
E O C R - S E 2 - E 0 5 - N 2 2 0

① ② ③ ④ ⑤

①	Model		
②	Easy Type		
③	Current	05	0.5 ~ 6.5A
		30	3 ~ 35A
		60	5 ~ 70A
		120	10 ~ 120A
④	Condition	N	Normal Energized
		R	Normal De-energized
⑤	Control Voltage	24	AC/DC24,50/60Hz
		110	AC110V,50/60Hz
		220	AC 90 ~ 260V, 50/60Hz
		440	AC180 ~ 460V, 50/60Hz

EOCR-DS(Easy Type)(1c)

Electronic Overload Relay



General Description

EOCR-DS(Easy type) Electronic overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Operating (Trip) Time
Overload	O-TIME
Phase Loss	O-TIME
Locked Rotor	O-TIME+D-TIME

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Delay Time	D-TIME	Set two to three seconds lnger than the motor starting time.
Operating Time	O-TIME	Over-current run time.Set less than the motor's endurance time with over-current.
Rated Current	Load	Set over 110% of the motor's rated current of under 120% of its operating current

Manual / Electric Reset

Press the RESET button or turn off the power (A1,A2)-.Remote Reset is possible to install the SW on afar.

TEST Instruction

With test button hold down,the red LED is on and the product will trip after O-TIME.
The relay will be de-energized when RESET button is pushed or the control power is disconnected.

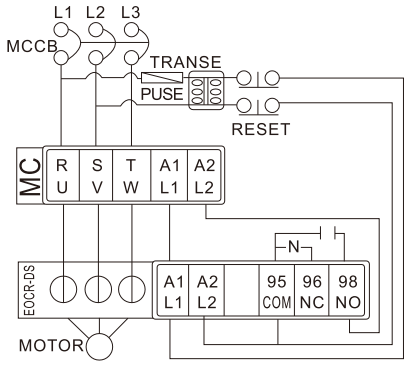
LED Indication

Condition	PWR(Green)LED	Trip(Red)LED	Remarks
Power	○	×	○:ON ×:OFF
Normal Running	○	×	
Trip	×	○	

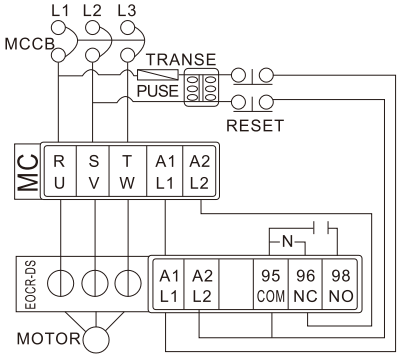
Specifications

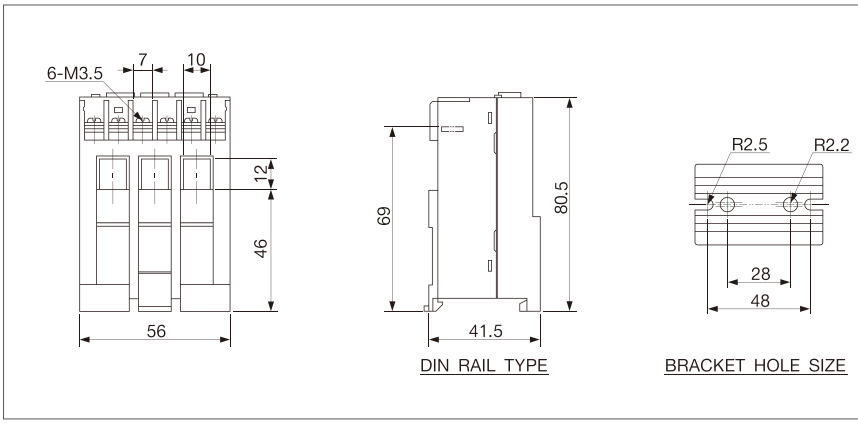
Current Setting		Type	Range
		05	0.5 ~ 6.5A
		30	3 ~ 35A
		60	5 ~ 70A
		120	10 ~ 120A
Time	Starting	D-TIME	0.2 ~ 30 sec
	Operation	O-TIME	0.2 ~ 10 sec
Reset			Manual / Electric Reset
Indicator			LED
Control Voltage	Voltage Range	24	AC/DC 24V
		110	AC 110V
		220	AC 90 ~ 260V
		440	AC 180 ~ 460V
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition	N Type	When powered, 95⊣⊢96 Open, 95⊣ ⊢98 Close
		R Type	When powered, 95⊣⊢96 Close, 95⊣ ⊢98 Open
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Mounting			35mm DIN-Rail / Panel
Weight			<120gr.

N-Type(Safer than type R)



R-Type





Ordering

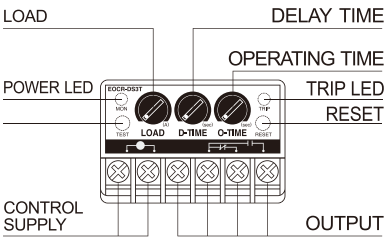
E O C R - D S - E 0 5 N 2 2 0

① ② ③ ④ ⑤

①	Model		
②	Easy Type		
③	Current	05	0.5 ~ 6.5A
		30	3 ~ 35A
		60	5 ~ 70A
		120	10 ~ 120A
④	Condition	N	Normal Energized
		R	Normal De-energized
⑤	Control Voltage	24	AC/DC24,50/60Hz
		110	AC110V,50/60Hz
		220	AC 90 ~ 260V, 50/60Hz
		440	AC180 ~ 460V, 50/60Hz

EOCR-DS(Standard Type)(1a1b)

Electronic Overload Relay



General Description

EOCR-DS(Standard Type) Electronic overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Operating (Trip) Time
Overload	O-TIME
Phase Loss	O-TIME
Locked Rotor	O-TIME+D-TIME

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Delay Time	D-TIME	Set two to three seconds lnger than the motor starting time.
Operating Time	O-TIME	Over-current run time.Set less than the motor's endurance time with over-current.
Rated Current	Load	Set over 110% of the motor's rated current of under 120% of its operating current

Manual / Electric Reset

Press the RESET button or turn off the power (A1,A2)-.Remote Reset is possible to install the SW on afar.

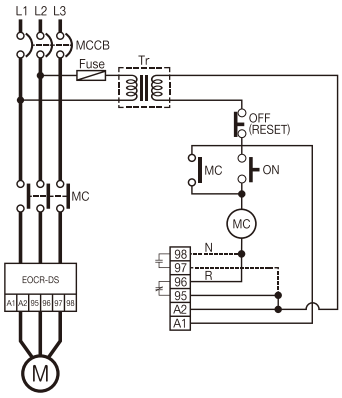
TEST Instruction

With test button hold down,the red LED is on and the product will trip after O-TIME.
The relay will be de-energized when RESET button is pushed or the control power is disconnected.

LED Indication

Condition	PWR(Green)LED	Trip(Red)LED	Remarks
Power	○	×	○:ON ×:OFF
Normal Running	○	×	
Trip	×	○	

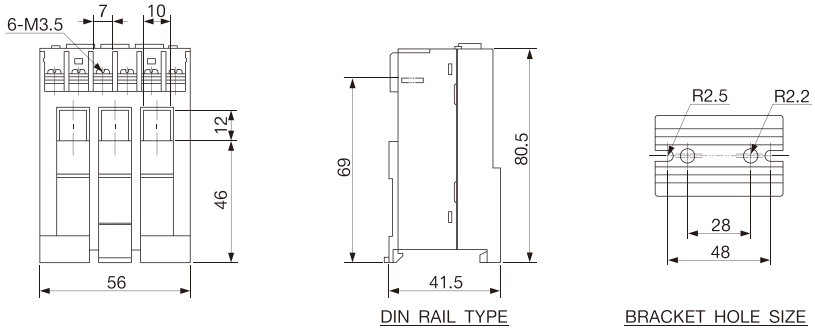
N-Type(Safer than type R)



※ For N-type model,with control power on
95 ⫞⫟ 96 is Open,
97 ⫞⫟ 98 is Closed

Specifications

Current Setting		Type	Range
		05	0.5 ~ 6.5A
		30	3 ~ 35A
		60	5 ~ 70A
		120	10 ~ 120A
Time	Starting	D-TIME	0.2 ~ 30 sec
	Operation	O-TIME	0.2 ~ 10 sec
Reset			Manual / Electric Reset
Indicator			LED
Control Voltage	Voltage Range	24	AC/DC 24V
		110	AC 110V
		220	AC 90 ~ 260V
		440	AC 180 ~ 460V
	Frequency		50/60Hz
Output	Contact		2-SPDT(1a1b)
	Condition	N Type	When powered, 95⫞⫟96 Open, 97⫞⫟98 Close
		R Type	When powered, 95⫞⫟96 Close ,97⫞⫟98 Open
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Mounting			35mm DIN-Rail / Panel
Weight			<130gr.



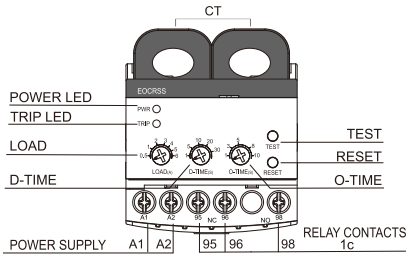
Ordering

E	O	C	R	-	D	S	-	S	-	0	5	N	2	2	0
①								②		③		④	⑤		

①	Model		
②	Standard Type		
③	Current	05	0.5 ~ 6.5A
		30	3 ~ 35A
		60	5 ~ 70A
		120	10 ~ 120A
④	Condition	N	Normal Energized
		R	Normal De-energized
⑤	Control Voltage	24	AC/DC24,50/60Hz
		110	AC110V,50/60Hz
		220	AC 90 ~ 260V, 50/60Hz
		440	AC180 ~ 460V, 50/60Hz

EOCRSS(Standard Type)

Electronic Overload Relay



General Description

EOCRSS Electronic overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Operating (Trip) Time
Overload	O-TIME
Phase Loss	O-TIME
Locked Rotor	O-TIME+D-TIME

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Delay Time	D-TIME	Set two to three seconds lnger than the motor starting time.
Operating Time	O-TIME	Over-current run time.Set less than the motor's endurance time with over-current.
Rated Current	Load	Set over 110% of the motor's rated current of under 120% of its operating current

Manual / Electric Reset

Press the RESET button or turn off the power (A1,A2)-.Remote Reset is possible to install the SW on afar.

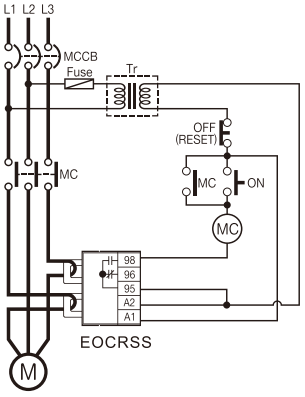
TEST Instruction

With test button hold down,the red LED is on and the product will trip after O-TIME.
The relay will be de-energized when RESET button is pushed or the control power is disconnected.

LED Indication

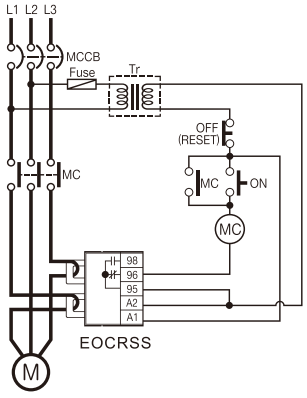
Condition	PWR(Green)LED	Trip(Orange)LED	Remarks
Power	◑	×	◑:Blink ○:ON ×:OFF
Normal Running	○	×	
Trip	×	○	

N-Type(Safer than type R)



※ For N-type model,with control power on
95 ⊣⊢ 96 is Open,
95 ┤ ├ 98 is Closed

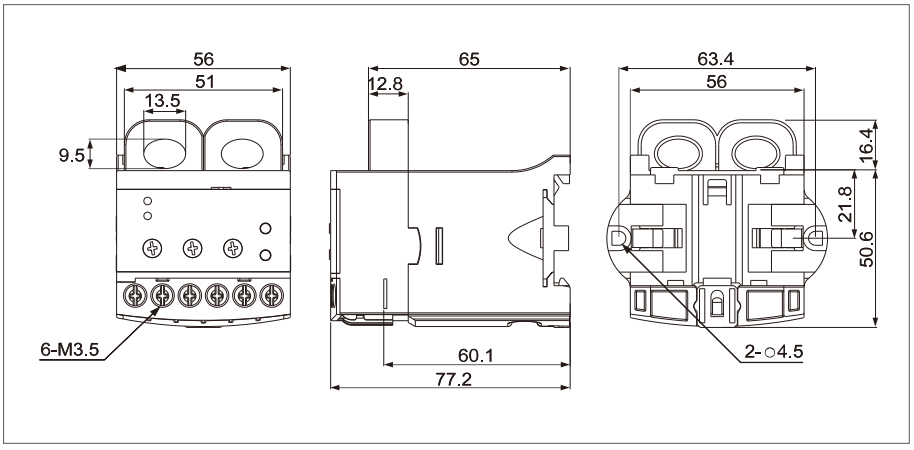
R-Type



※ For R-type model,with control power on
95 ⊣⊢ 96 is Closed,
95 ┤ ├ 98 is Open

Specifications

Current Setting		Type	Range
		05	0.5 ~ 6A
		30	3 ~ 30A
		60	5 ~ 60A
TIME	Starting	D-TIME	0.2 ~ 30 sec
	Operation	O-TIME	0.2 ~ 10 sec
Reset			Manual / Electric Reset
Indicator			LED
Accuracy		Current	±10%
		Time	±15%
Control Voltage	Voltage Range	24	AC/DC 24V
		110	AC110V
		220	AC 90 ~ 260V
		440	AC180 ~ 460V
	Frequency		50/60Hz
Output	Contact		1-SPDT (1C)
	Condition	N Type	When powered, 95⊣⊢96 Open, 95┤ ├98 Close
		R Type	When powered, 95⊣⊢96 Close ,95┤ ├98 Open
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail / Panel
Weight			<170gr.



Ordering

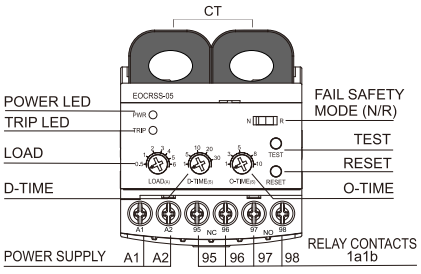
E O C R S S - S 0 5 - N 2 2 0

① ② ③ ④ ⑤

①	Model		
②	Standard Type		
③	Current	05	0.5 ~ 6A
		30	3 ~ 30A
		60	5 ~ 60A
④	Condition	N	Normal Energized
		R	Normal De-energized
⑤	Power Supply	24	AC/DC 24V,50/60Hz
		110	110VAC,50/60Hz
		220	AC 90 ~ 260V, 50/60Hz
		440	AC180 ~ 460V, 50/60Hz

EOCRSS(Premium Type)

Electronic Overload Relay



General Description

EOCRSS Electronic overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Operating (Trip) Time
Overload	O-TIME
Phase Loss	O-TIME
Locked Rotor	O-TIME+D-TIME

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Delay Time	D-TIME	Set two to three seconds Inger than the motor starting time.
Operating Time	O-TIME	Over-current run time.Set less than the motor's endurance time with over-current.
Rated Current	Load	Set over 110% of the motor's rated current of under 120% of its operating current

Manual / Electric Reset

Press the RESET button or turn off the power (A1,A2)-.Remote Reset is possible to install the SW on afar.

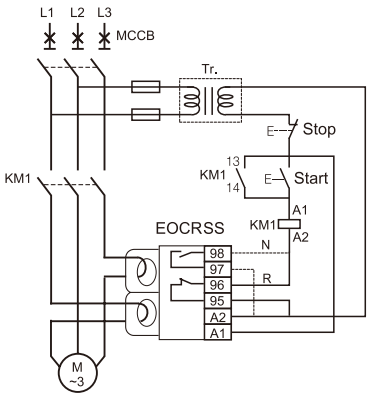
TEST Instruction

With test button hold down,the red LED is on and the product will trip after O-TIME.
The relay will be de-energized when RESET button is pushed or the control power is disconnected.

LED Indication

Condition	PWR(Green)LED	Trip(Orange)LED	Remarks
Power	◑	×	◑:Blink ○:ON ×:OFF
Normal Running	○	×	
Trip	×	○	

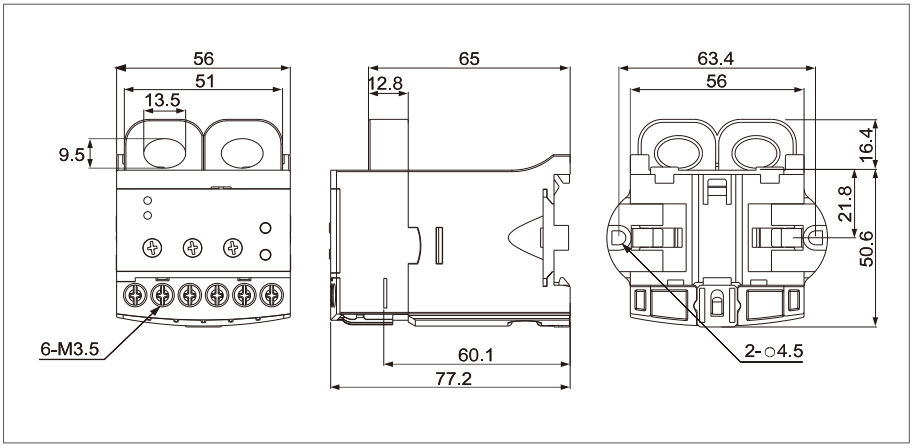
N-Type(Safer than type R)



※ For N-type model,with control power on
95 ⊣/⊢ 96 is Open,
95 ⊣ ⊢ 98 is Closed

Specifications

Current Setting		Type	Range
		05	0. 5 ~ 6A
		30	3 ~ 30A
		60	5 ~ 60A
TIME	Starting	D-TIME	0.2 ~ 30 sec
	Operation	O-TIME	0.2 ~ 10 sec
Reset			Manual / Electric Reset
Indicator			LED
Accuracy		Current	±10%
		Time	±15%
Control Voltage	Voltage Range	S	AC/DC 24 ~ 240V
		220	AC 90 ~ 260V
		440	AC180 ~ 460V
	Frequency		50/60Hz
Output	Contact		2-SPDT (1a1b)
	Condition	N Type	When powered, 95⊣/⊢96 Open, 97⊣ ⊢98 Close
		R Type	When powered, 95⊣/⊢96 Close ,97⊣ ⊢98 Open
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail / Panel
Weight			<170gr.



Ordering

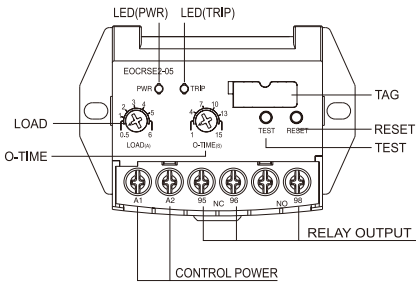
E O C R S S - P 0 5 - 2 2 0

① ② ③ ④

①	Model		
②	Premium Type		
③	Current	05	0.5 ~ 6A
		30	3 ~ 30A
		60	5 ~ 60A
④	Power Supply	S	AC/DC 24 ~ 240V,50/60Hz
		220	AC 90 ~ 260V, 50/60Hz
		440	AC180 ~ 460V, 50/60Hz

EOCRSE2(Standard Type)

Electronic Overload Relay



General Description

EOCRSE2 Electronic overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Operating (Trip) Time
Overload	O-TIME
Phase Loss	O-TIME
Locked Rotor	O-TIME

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Operating Time	O-TIME	Over-current run time.Set less than the motor's endurance time with over-current.
Rated Current	Load	Set over 110% of the motor's rated current of under 120% of its operating current

Manual / Electric Reset

Press the RESET button or turn off the power (A1,A2)-.Remote Reset is possible to install the SW on afar.

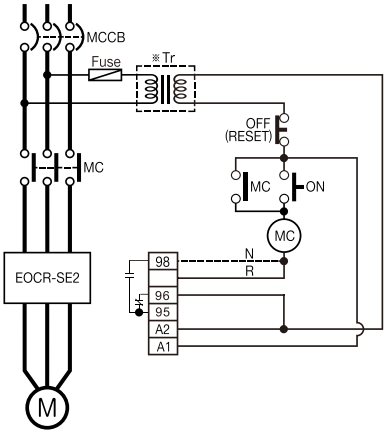
TEST Instruction

With test button hold down,the red LED is on and the product will trip after O-TIME.
The relay will be de-energized when RESET button is pushed or the control power is disconnected.

LED Indication

Condition	PWR(Green)LED	Trip(Orange)LED	Remarks
Power	◑	×	◑:Blink ○:ON ×:OFF
Normal Running	○	×	
Trip	×	○	

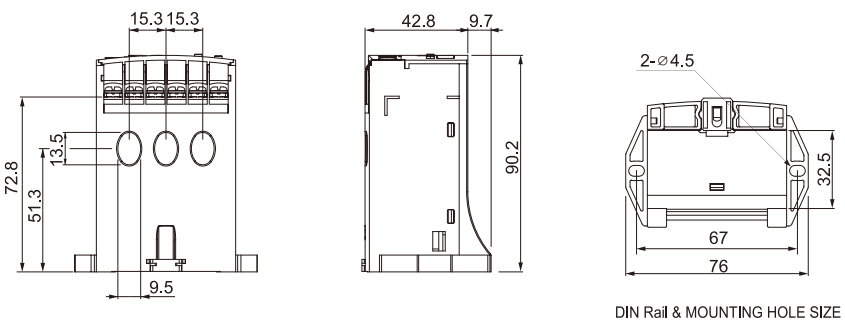
N-Type(Safer than type R)



※ For N-type model,with control power on
95 ⊣/⊢ 96 is Open,
95 ⊣ ⊢ 98 is Closed

Specifications

Current Setting		Type	Range
		05	0.5 ~ 6A
		30	3 ~ 30A
		60	5 ~ 60A
TIME	Operation	O-TIME	0.2 ~ 15 sec
Reset			Manual / Electric Reset
Indicator			LED
Accuracy		Current	±10%
		Time	±15%
Control Voltage	Voltage Range		AC/DC 24 ~ 240V
	Frequency		50/60Hz
Output	Contact		1-SPDT (1C)
	Condition	N Type	When powered, 95⊣/⊢96 Open, 95⊣ ⊢98 Close
		R Type	When powered, 95⊣/⊢96 Close ,95⊣ ⊢98 Open
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail / Panel
Weight			<200gr.



DIN Rail & MOUNTING HOLE SIZE

Ordering

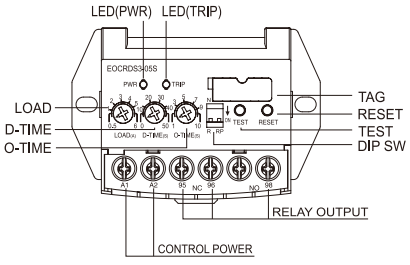
E O C R S E 2 - S 0 5 - N

① ② ③ ④

①	Model		
②	Standard Type		
③	Current	05	0.5 ~ 6A
		30	3 ~ 30A
		60	5 ~ 60A
④	Condition	N	Normal Energized
		R	Normal De-energized

EOCRDS3(Standard Type)

Electronic Overload Relay



General Description

EOCRDS3 Electronic overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Operating time
Overload	After the set O-Time operation
Stall	4 set or less
Phase Loss	After the set D-Time operation
Reverse Phase	0.1 set

Manual / Electric Reset

Press the RESET button or turn off the power (A1,A2)-. Remote Reset is possible to install the SW on afar.

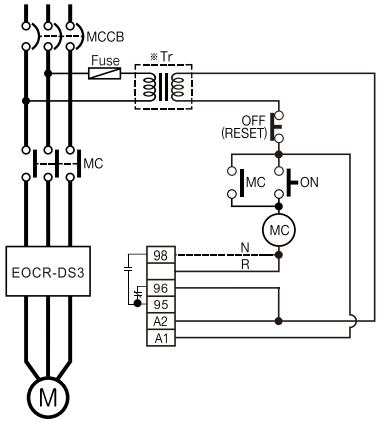
TEST Instruction

With test button hold down,the red LED is on and the product will trip after O-TIME.
The relay will be de-energized when RESET button is pushed or the control power is disconnected.

LED Indication

Condition		PWR(Green)LED		Trip(Orange)LED	
Power		Blink			
Starting		Blink		Blink	
Normal Running		On			
Over-current		On		Flash	
Trip				On	
Stall				Blink	
Phase Loss	L1			Blink	
	L2			Blink	
	L3			Blink	
Reverse Phase		Blink alternately			

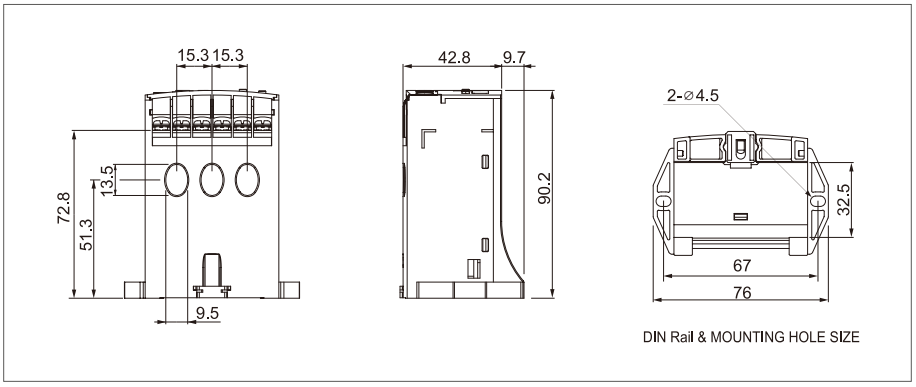
N-Type(Safer than type R)



※ For N-type model,with control power on
95 ⊣⊢ 96 is Open,
95 ⊣ ⊢ 98 is Closed

Specifications

Current Setting		Type	Range
		05	0.5 ~ 6A
		30	3 ~ 30A
		60	5 ~ 60A
TIME	Starting	D-TIME	1 ~ 50 sec
	Operation	O-TIME	1 ~ 10 sec
Reset			Manual / Electric Reset
Indicator			LED
Accuracy		Current	±10%
		Time	±15%
Control Voltage	Voltage Range		AC/DC 24 ~ 240V
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition	N Type	When powered, 95⊣⊢96 Open, 95⊣ ⊢98 Close
		R Type	When powered, 95⊣⊢96 Close ,95⊣ ⊢98 Open
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail / Panel
Weight			<210gr.



DIN Rail & MOUNTING HOLE SIZE

Ordering

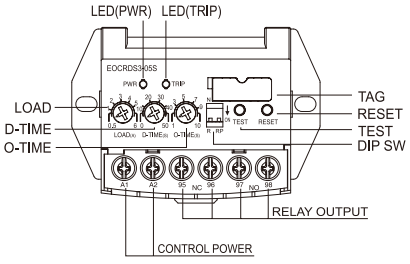
E O C R D S 3 - S 0 5

① ② ③

①	Model		
②	Standard Type		
③	Current	05	0.5 ~ 6A
		30	3 ~ 30A
		60	5 ~ 60A

EOCRDS3(Premium Type)(1a1b)

Electronic Overload Relay



General Description

EOCRDS3 Electronic overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Operating time
Overload	After the set O-Time operation
Stall	4 set or less
Phase Loss	After the set D-Time operation
Reverse Phase	0.1 set

Manual / Electric Reset

Press the RESET button or turn off the power (A1,A2)-. Remote Reset is possible to install the SW on afar.

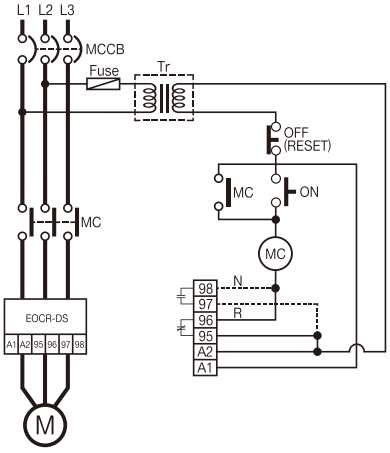
TEST Instruction

With test button hold down,the red LED is on and the product will trip after O-TIME.
The relay will be de-energized when RESET button is pushed or the control power is disconnected.

LED Indication

Condition		PWR(Green)LED		Trip(Orange)LED	
Power		Blink			
Starting		Blink		Blink	
Normal Running		On			
Over-current		On		Flash	
Trip				On	
Stall				Blink	
Phase Loss	L1			Blink	
	L2			Blink	
	L3			Blink	
Reverse Phase		Blink alternately			

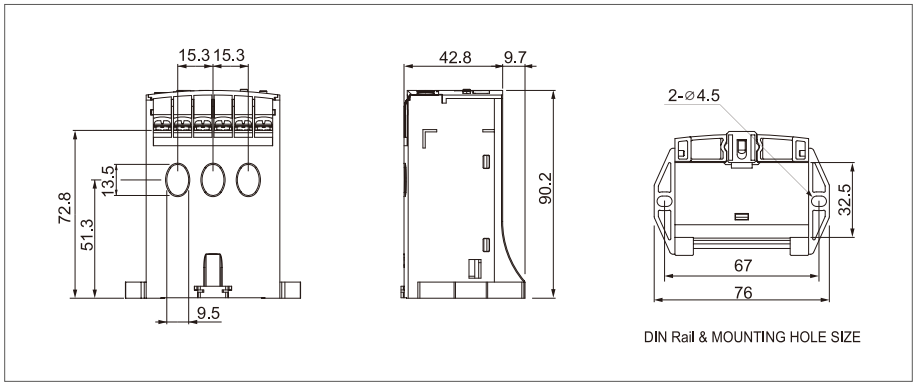
N-Type(Safer than type R)



※ For N-type model,with control power on
95 ⊣⊢ 96 is Open,
95 ⊣ ⊢ 98 is Closed

Specifications

Current Setting		Type	Range
		05	0.5 ~ 6A
		30	3 ~ 30A
		60	5 ~ 60A
TIME	Starting	D-TIME	1 ~ 50 sec
	Operation	O-TIME	1 ~ 10 sec
Reset			Manual / Electric Reset
Indicator			LED
Accuracy		Current	±10%
		Time	±15%
Control Voltage	Voltage Range		AC/DC 24 ~ 240V
	Frequency		50/60Hz
Output	Contact		2-SPDT(1a1b)
	Condition	N Type	When powered, 95⊣⊢96 Open, 97⊣ ⊢98 Close
		R Type	When powered, 95⊣⊢96 Close, 97⊣ ⊢98 Open
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail / Panel
Weight			<210gr.



DIN Rail & MOUNTING HOLE SIZE

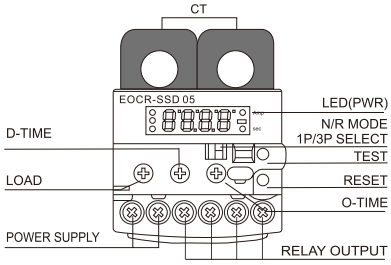
Ordering

E O C R D S 3 - P 0 5
① ② ③

①	Model		
②	Premium Type		
③	Current	05	0.5 ~ 6A
		30	3 ~ 30A
		60	5 ~ 60A

EOCRSSD

Digtal Over-current Relay



General Description

EOCR-SSD Electronic overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Trip Time	Description
Overload	O-TIME	Is<In
Phase Loss	3sec	[(MAX-MIN)/MAX] ×100 >90
Locked Rotor	0.5sec after elapse dt	≥3times OC setting value

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Delay Time	D-TIME	Set two to three seconds lnger than the motor starting time.
Operating Time	O-TIME	Over-current run time.Set less than the motor's endurance time with over-current.
Rated Current	Load	Set over 110% of the motor's rated current of under 120% of its operating current

Manual / Electric Reset

Press the RESET button or turn off the power(A1,A2) -Remote Reset is possible to install the SW on afar.

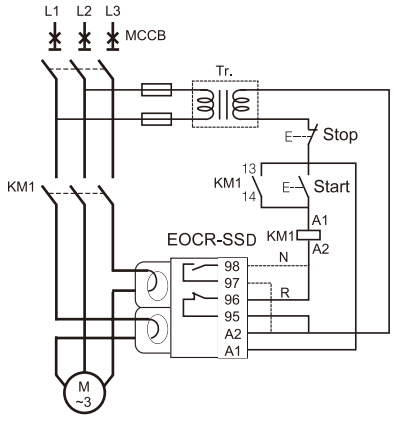
Configuration Menu

MODE	Description	Range	Remark
c 30	Over current threshold	05 Type: 0.5A ~ 6A 30 Type: 3A ~ 30A 60 Type: 10A ~ 60A	0.5 ~ 6A : 0.1A steps 3~30A: 1A steps 10~60 A: 1A steps
d 10	Starting delay time	1~30 sec	1sec steps
o 10	Over current duration	0.5,1~10 sec	0.5sec 1~10sec(1sec steps)
TEST End	Test	Display"END" after elapsing 3 sec + preset O-Time Test is Not applicable under normal operation Operation time = 3 sec + O-Time	

Trip Cause Indication

o 10.0	Over Current (oc)	Tripped with 10A over-current
PL-1	Phase Loss(PL)	Tripped by phase loss on L1
PL-2		Tripped by phase loss on L2
PL-3		Tripped by phase loss on L3
-Lc-	stall at starting	Tripped by stall while starting

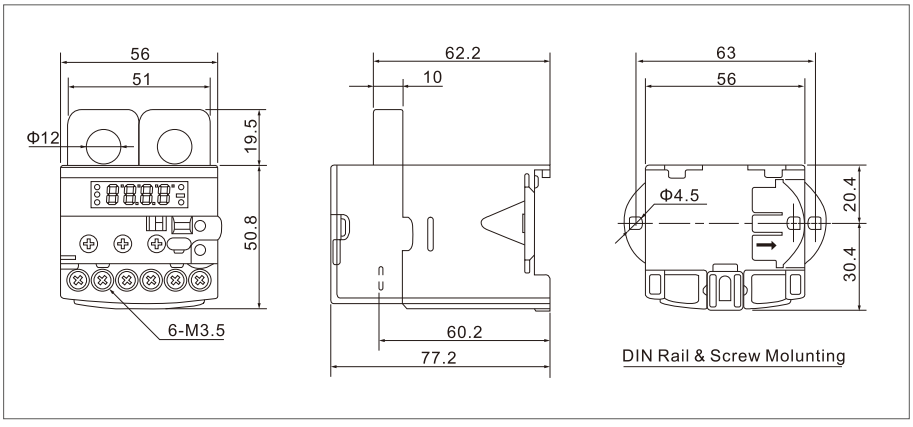
N-Type(Safer than type R)



※ For N-type model,with control power on
95 ⊣⊢ 96 is Open,
95 ⊣ ⊢ 98 is Closed

Specifications

Current Setting		Type	Range
		05	0.5 ~ 6A
		30	3 ~ 30A
		60	5 ~ 60A
		120	10 ~ 120A
TIME	Starting	D-TIME	0.2 ~ 30 sec
	Operation	O-TIME	0.2 ~ 10 sec
Reset			Manual / Electric Reset
Indicator			Digital
Accuracy		Current	±1%
		Time	±1%
Control Voltage	Voltage Range	S	AC/DC 24 ~ 240V
		110	AC110V
		220	AC220V
		380	AC380V
	Frequency		50/60Hz
Output	Contact		2-SPDT (1a1b)
	Condition	N Type	When powered, 95⊣⊢96 Open, 97⊣ ⊢98 Close
		R Type	When powered, 95⊣⊢96 Close ,97⊣ ⊢98 Open
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight			<230gr.



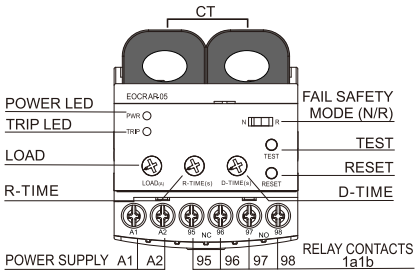
Ordering

E	O	C	R	S	S	D	-	0	5	-	2	2	0
							①			②			③

①	Model		
②	Current	05	0.5 ~ 6A
		30	3 ~ 30A
		60	5 ~ 60A
		120	10 ~ 120A
③	Control Voltage	S	AC/DC 24 ~ 240V
		110	AC110V,50/60Hz
		220	AC220V,50/60Hz
		380	AC380V,50/60Hz

EOCRAR

Electronic Automatic Reset Overload Relay



General Description

EOCRAR Electronic automatic reset overload relay are designed to monitor single phase and three-phase motors against overheating and damage caused by Over-load and phase loss at industrial sites.

Function

Protective Item	Operating (Trip) Time
Overload	O-TIME
Phase Loss	O-TIME
Locked Rotor	O-TIME

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Reset Time	R-TIME	Set auto reset delay according to cooling needs
Operating Time	O-TIME	Over-current run time.Set less than the motor's endurance time with over-current.
Rated Current	Load	Set over 110% of the motor's rated current of under 120% of its operating current

Manual / Electric Reset

Press the RESET button or turn off the power (A1,A2)-.Remote Reset is possible to install the SW on afar.

TEST Instruction

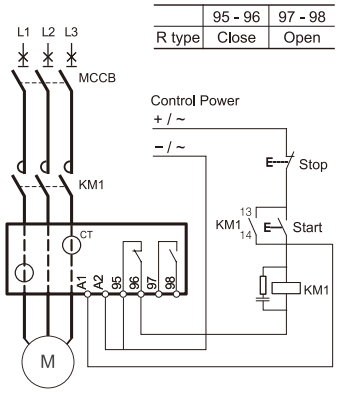
With test button hold down,the red LED is on and the product will trip after O-TIME.
The relay will be de-energized when RESET button is pushed or the control power is disconnected.

LED Indication

Condition	PWR(Green)LED	Trip(Orange)LED	Remarks
Power	◑	×	◑:Blink ○:ON ×:OFF
Normal Running	○	×	
Trip	×	○	

N-Type(Safer than type R)

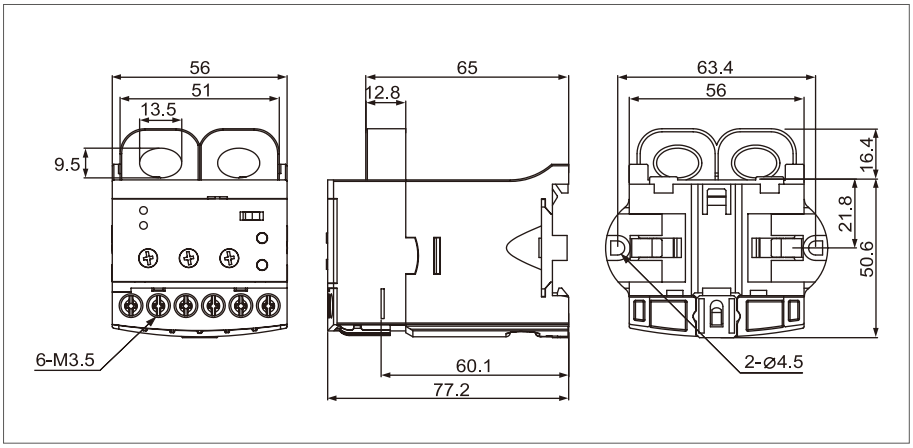
R type	95 - 96	97 - 98
	Close	Open



※ For N-type model,with control power on
95 ⊣⊢ 96 is Open,
95 ⊣ ⊢ 98 is Closed

Specifications

Current Setting		Type	Range
		05	0.5 ~ 6A
		30	3 ~ 30A
		60	5 ~ 60A
Time	Operating	O-TIME	0.2 ~ 30 sec
	Recovery	R-TIME	0.2 ~ 120 sec / OFF
Reset			Manual / Electric Reset
Indicator			LED
Control Voltage	Voltage range	S	AC/DC 24 ~ 240V
		220	AC90 ~ 260V
		440	AC180 ~ 460V
	Frequency		50/60Hz
Output	Contact		2-SPDT (1a1b)
	Condition	N Type	When powered, 95⊣⊢96 Open, 97⊣ ⊢98 Close
		R Type	When powered, 95⊣⊢96 Close ,97⊣ ⊢98 Open
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail / Panel (BracketPanel mounting)
Weight			<170gr.



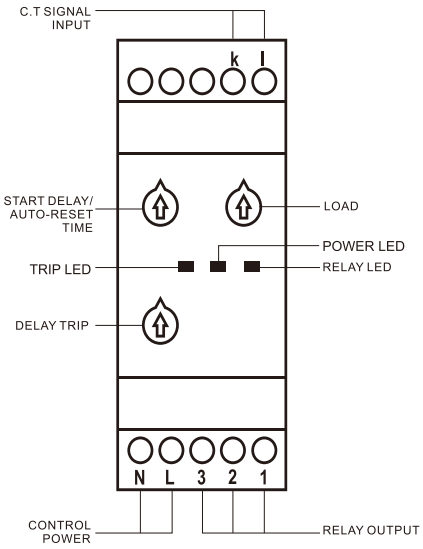
Ordering

E O C R A R - 0 5 - S
① ② ③

①	Model		
②	Current	05	0.5 ~ 6A
		30	3 ~ 30A
		60	5 ~ 60A
③	Condition	S	AC/DC 24 ~ 240V,50/60Hz
		220	AC 90 ~ 260V, 50/60Hz
		440	AC180 ~ 460V, 50/60Hz

AKR-03D

Electronic Auto-Reset Overload Relay



General Description

AKR Electronic Auto-reset overload relay are designed to prevent loads from being damaged due to overload.

Function

Protective Item	Operating (Trip)time
Overload	DT

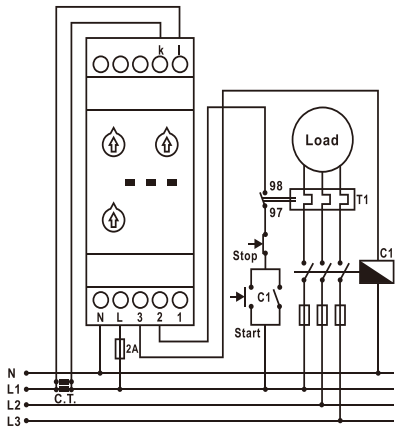
Set

Classification	Set Knob	Set up
Start Delay Auto-Reset	ST	Sets the start (inrush current) time.
Delay Trip	DT	Sets the overload fault waiting time.
Rated Curent	A>	Over current set value=(Over current value of load/current transformer value)*5 Example: If the over current value to be adjusted is 100A and the current transformer value used is 250/5A, the over current set value will be set as 100A when A> button is taken to the 2 stage. Over current set value=(100/250)*5=2

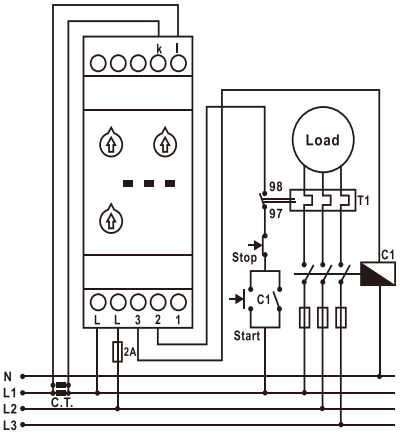
LED Indication

Condition	A>(Red)	ON(Green)	OUT(Red)	Remarks
Power	×	○	○	○:ON ×:OFF
Normal Running	×	○	○	
Trip	○	○	×	

A> Led: Error Indication
ON Led: Power Indication
OUT Led: Relay output Indication



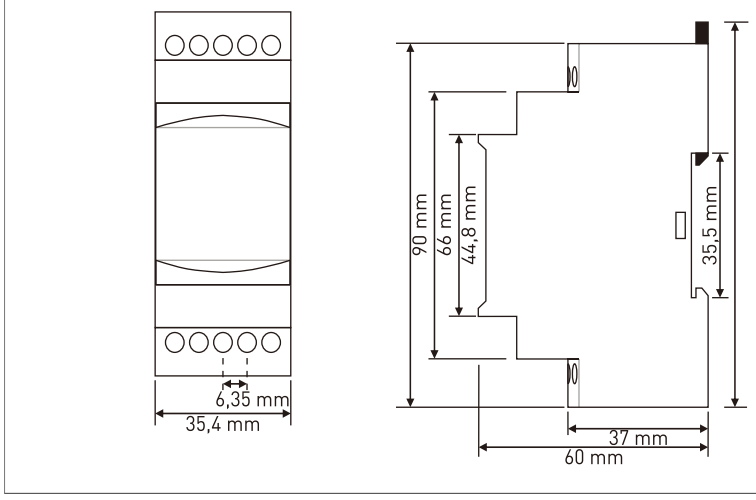
※ For L-N Connection diagram



※ For L-L Connection diagram

Specifications

Current Setting		Type	Range
		03D	5 ~ 250/5A
TIME	Start Delay	ST	1 ~ 10 sec
	Auto Reset/Delay Trip	DT	0.5 ~ 2.5 sec
Reset			Auto reset
Indicator			LED
Accuracy		Current	±10%
		Time	±15%
Control Voltage	Voltage Range	24	AC/DC 24V
		110	AC110V
		220	AC 150 ~ 260VAC
		380	AC 380V
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When normal running 2┤ ├3 close, 1┤ ├2 open
			When Trip 2┤ ├3 open, 1┤ ├2 close
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<120gr.



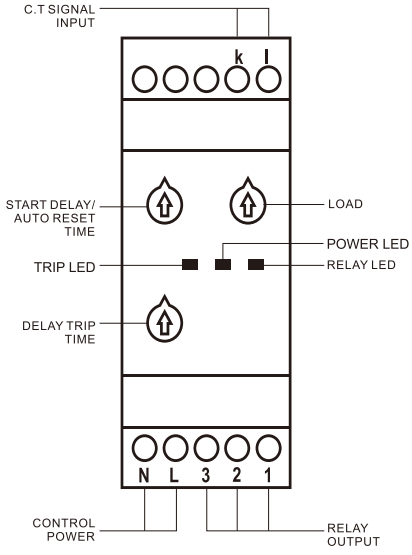
Ordering

A	K	R	-	0	3	D	-	2	2	0
	①				②				③	

①	Model		
②	Current	03D	5 ~ 250/5A
③	Control Voltage	24	24VAC/DC,50/60Hz
		110	110VAC,50/60Hz
		220	150 ~ 260VAC,50/60Hz
		380	380VAC,50/60Hz

AKR-XXD

Electronic Auto-Reset Overload Relay(Included C.T)



General Description

AKR Electronic Auto-reset overload relay are designed to prevent loads from being damaged due to overload.

Function

Protective Item	Operating (Trip)time
Overload	DT

Set

Classification	Set Knob	Set up
Start Delay Auto-Reset	ST	Sets the start (inrush current) time.
Delay Trip	DT	Sets the overload fault waiting time.
Rated Curent	A>	Overload set value

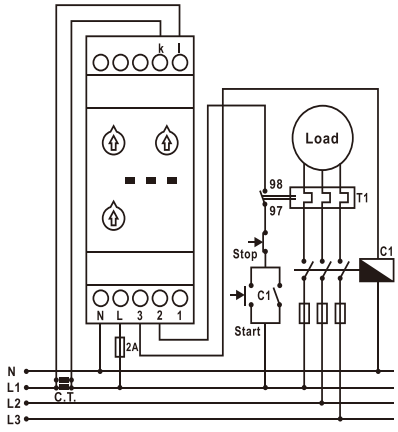
LED Indication

Condition	A>(Red)	ON(Green)	OUT(Red)	Remarks
Power	×	○	○	○:ON ×:OFF
Normal Running	×	○	○	
Trip	○	○	×	

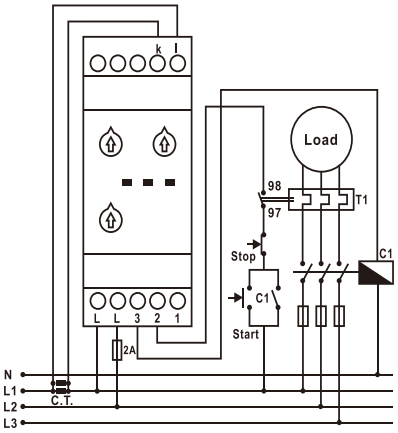
A> Led: Error Indication
ON Led: Power Indication
OUT Led: Relay output Indication

Specifications

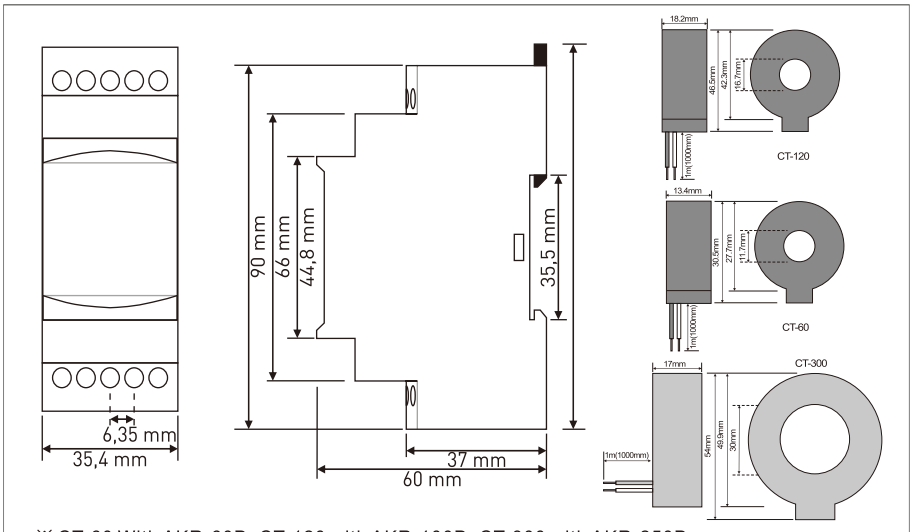
		Type	Range
Current Setting		60D	1 ~ 63A
		100D	10 ~ 100A
		250D	10 ~ 250A
TIME	Start Delay	ST	1 ~ 10 sec
	Auto Reset/Delay Trip	DT	0.5 ~ 2.5 sec
Reset			Auto reset
Indicator			LED
Accuracy		Current	±10%
		Time	±15%
Control Voltage	Voltage Range	24	AC/DC 24V
		110	AC110V
		220	AC 150 ~ 260VAC
		380	AC 380V
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When normal running 2┤├3 close, 1┤├2 open
			When Trip 2┤├3 open, 1┤├2 close
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<120gr.(60D); <160gr.(100D); <170gr.(250D)



※ For L-N Connection diagram



※ For L-L Connection diagram



※ CT-60 With AKR-60D, CT-120 with AKR-100D, CT-300 with AKR-250D

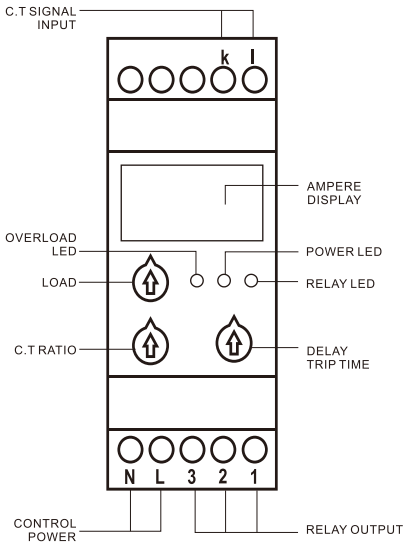
Ordering

A	K	R	-	6	0	D	-	2	2	0
		①			②				③	

①	Model		
②	Current	60D	1 ~ 63A
		100D	10 ~ 100A
		250D	10 ~ 250A
③	Control Voltage	24	24VAC/DC,50/60Hz
		110	110VAC,50/60Hz
		220	150 ~ 260VAC,50/60Hz
		380	380VAC,50/60Hz

DAKR-03D

Digital Auto-Reset Overload Relay



General Description

DAKR Auto-reset over load relays are designed to prevent loads from being damaged due to over-current.

Function

Protective Item	Operating (Trip)time
Overload	<t> time setting

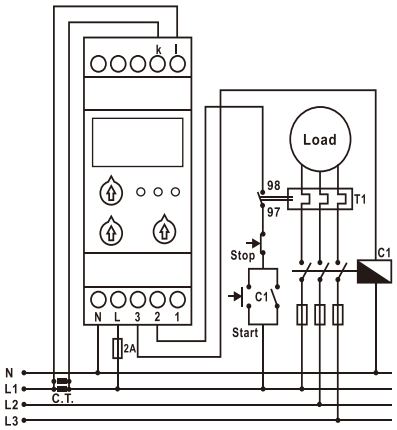
Set

Classification	Set Knob	Set up
Sets the over load fault waiting time	T	Sets the over load fault waiting time
Current ratio setting	....x5	Set the C.T ratio(MAX 250A)
Rated Current	A	Set the Over load rated

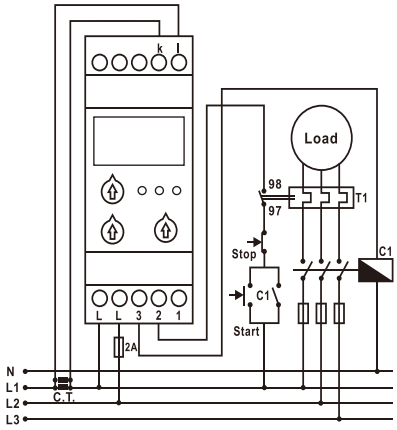
LED Indication

Condition	A>(Red)	ON(Red)	OUT(Green)	Remarks
Power	×	○	○	○:ON ×:OFF
Normal Running	×	○	○	
Trip	○	○	×	

A> Led: Error Indication
ON Led: Power Indication
OUT Led: Relay output Indication



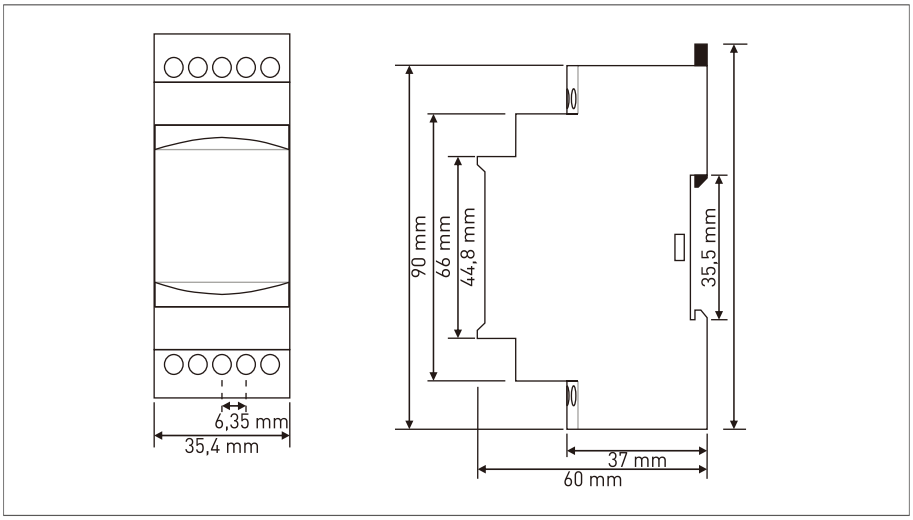
※ For L-N Connection diagram



※ For L-L Connection diagram

Specifications

Current Setting		Type	Range
		03D	0.5A ~ 5A ...../5A current transformer
TIME	Delay Trip	DT	0.1 ~ 20 sec
Reset			Auto reset
Indicator			Digital
Accuracy		Current	±1%
		Time	±1%
Control Voltage	Voltage Range	24	AC/DC 24V
		110	AC110V
		220	AC 150 ~ 260V
		380	AC 380V
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When normal running 2┤ ├3 close, 1┤ ├2 open
			When Trip 2┤ ├3 open, 1┤ ├2 close
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			130gr.



Ordering

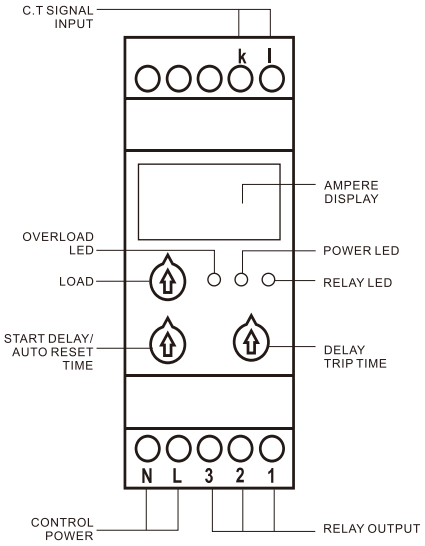
D A K R - 0 3 D - 2 2 0

① ② ③

①	Model		
②	Current	03D	5 ~ 250/5A
③	Control Voltage	24	24VAC/DC,50/60Hz
		110	110VAC,50/60Hz
		220	150 ~ 260VAC,50/60Hz
		380	380VAC,50/60Hz

DAKR-XXD

Digital Auto-Reset Overload Relay(Included C.T)



General Description

DAKR Auto-reset over load relay are designed to prevent loads from being damaged due to over-current.

Function

Protective Item	Operating (Trip)time
Overload	DT

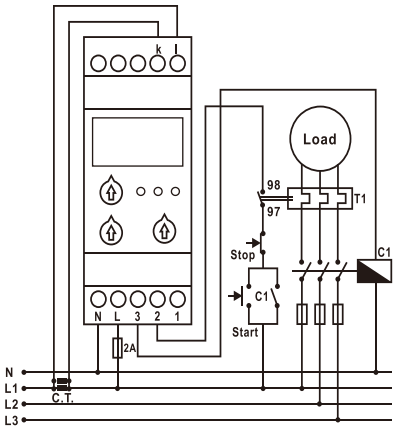
Set

Classification	Set Knob	Set up
Start Delay Auto-Reset	ST	Sets the start (inrush current) time.
Delay Trip	DT	Sets the overload fault waiting time.
Rated Curent	A>	Overload set value

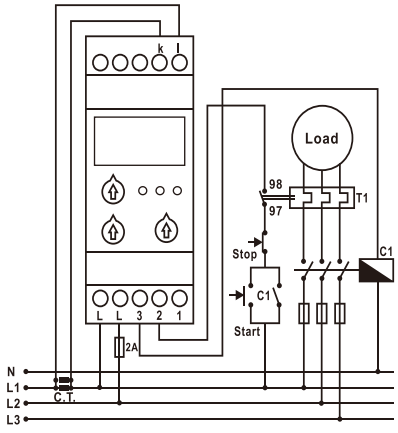
LED Indication

Condition	A>(Red)	ON(Red)	OUT(Green)	Remarks
Power	×	○	○	○:ON ×:OFF
Normal Running	×	○	○	
Trip	○	○	×	

A> Led: Error Indication
ON Led: Power Indication
OUT Led: Relay output Indication



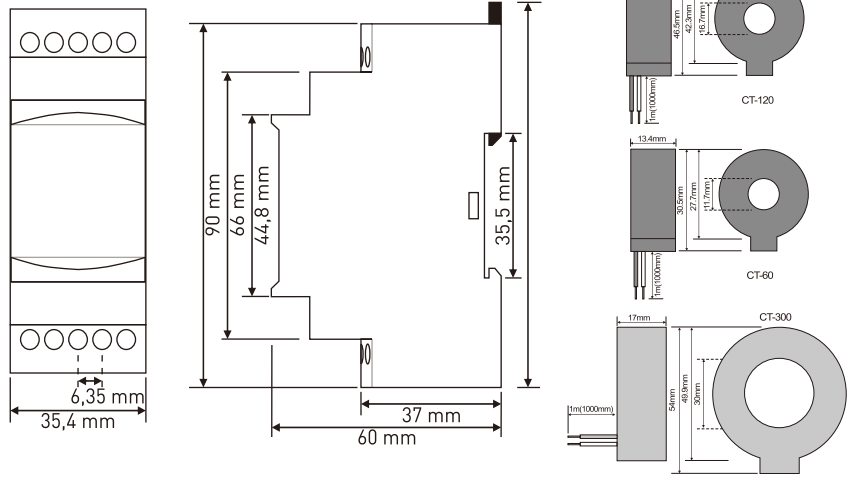
※ For L-N Connection diagram



※ For L-L Connection diagram

Specifications

Current Setting		Type	Range
		60D	1 ~ 63A
		100D	10 ~ 100A
		250D	10 ~ 250A
TIME	Start Delay	ST	0.1 ~ 20 sec
	Auto Reset/Delay Trip	DT	0.1 ~ 20 sec
Reset			Auto reset LED
Indicator			Digital
Accuracy		Current	±1%
		Time	±1%
Control Voltage	Voltage Range	24	AC/DC 24V
		110	AC110V
		220	AC 150 ~ 260V
		380	AC 380V
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When normal running 2┤ ├3 close, 1┤ ├2 open
			When Trip 2┤ ├3 open, 1┤ ├2 close
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<140gr(60D); <180gr (100D); <190gr(250D).



※ CT-60 With DAKR-60D, CT-120 with DAKR-100D, CT-300 with DAKR-250D

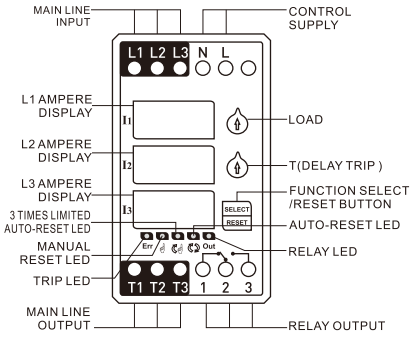
Ordering

D	A	K	R	-	6	0	D	-	2	2	0
					①				②		③

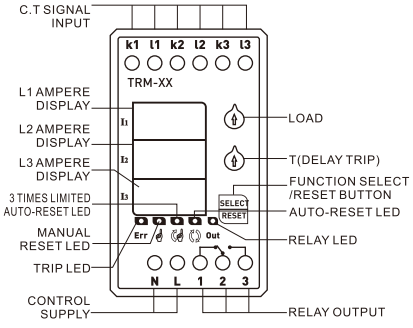
①	Model		
②	Current	60D	1 ~ 63A
		100D	10 ~ 100A
		250D	10 ~ 250A
③	Control Voltage	24	24VAC/DC,50/60Hz
		110	110VAC,50/60Hz
		220	150 ~ 260VAC,50/60Hz
		380	380VAC,50/60Hz

TRM

Digital Manual/Auto Reset Overload Relay



※ For TRM-03,TRM-12,TRM-25



※ For TRM-50,TRM-100,TRM-200, TRM-300,TRM-400

General Description

TRM-XX Digital auto-reset over load relays are designed to prevent loads from being damaged due to overload.

Function

Protective Item	Operating (Trip)time
Overload	<t> time setting
Asymmetry	2sec.Fixed(Except TRM-400)

Set

Classification	Set Knob	Set up
Delay Trip	T	Over load run time.
Rated Curent	A>	Set over 105% of the motor's rated current of under 110% of its operating current

LED Indication

Condition	ERR(Red)	OUT(Red)	Remarks
Power	×	○	○:ON ×:OFF
Normal Running	×	○	
Trip	○	×	

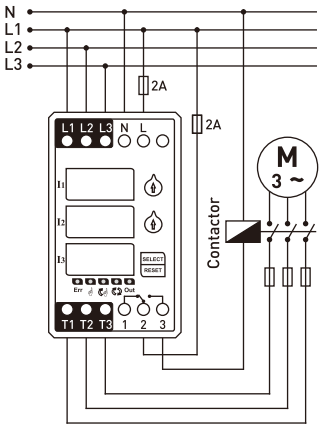
※ Err Led: Error indication.

Led: Manual reset indication.

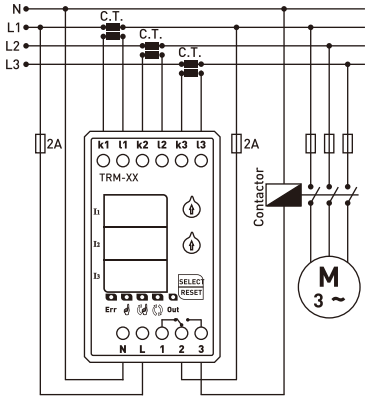
Led: 3 times limited auto-reset indication.

Led: Auto-reset indication.

OUT Led: Relay output Indication



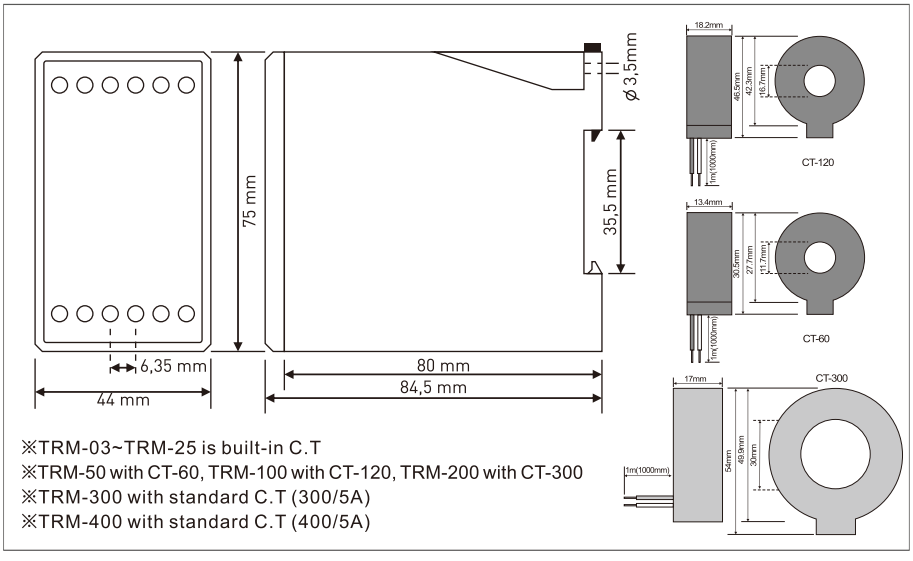
※ For TRM-03,TRM-12,TRM-25



※ For TRM-50,TRM-100,TRM-200, TRM-300,TRM-400

Specifications

Current Setting		Type	Range
		03	0.1 ~ 3A
		12	3 ~ 12A
		25	0.1 ~ 25A
		50	15 ~ 50A
		100	40 ~ 100A
		200	90 ~ 200A
		300	190 ~ 300A
		400	290 ~ 400A
TIME	Delay Trip	T	0.1 ~ 20 sec (TRM03~100);1 ~ 200sec (TRM200~300)
Reset			Manual / Auto reset
Indicator			Digital
Accuracy	Current		±1%
	Time		±1%
Control Voltage	Voltage Range	110	AC110V
		220	AC 150 ~ 260V
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When normal running 2┤ ├3 close, 1┤├2 open
			When Trip 2┤ ├3 open, 1┤├2 close
	Contacts		5A / 250VAC Resistive
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<290gr.(TRM-03~25); <350gr.(TRM-50); <500gr.(TRM-100~200); <1210gr.(TRM-300~400)



※TRM-03~TRM-25 is built-in C.T
※TRM-50 with CT-60, TRM-100 with CT-120, TRM-200 with CT-300
※TRM-300 with standard C.T (300/5A)
※TRM-400 with standard C.T (400/5A)

Ordering

T R M - 0 3 - 2 2 0

① ② ③

①	Model		
②	Current	03	0.1 ~ 3A
		12	3 ~ 12A
		25	0.1 ~ 25A
		50	15 ~ 50A
		100	40 ~ 100A
		200	90 ~ 200A
		300	190 ~ 300A
		400	290 ~ 400A
③	Control Voltage	110	110VAC,50/60Hz
		220	150 ~ 260VAC,50/60Hz

Under Current Relay

EUCR
Electronic Under Current Relay
156/page

AKR-01D
Electronic Auto-Reset Under Current Relay
158page

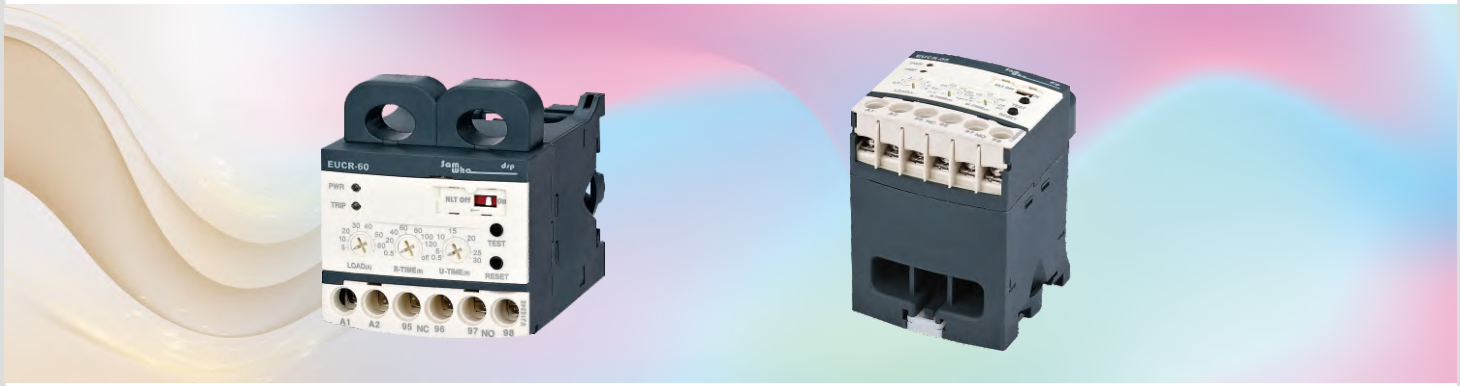
AKR-XXU
Electronic Auto-Reset Under Current Relay(Included C.T)
160/page

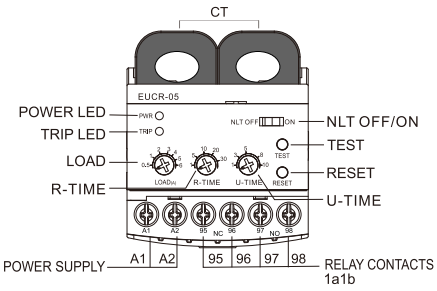
DAKR-XXU
Digital Auto-Reset Under Current Relay(Included C.T)
164/page

DAKR-01
Digital Auto-Reset Under Current Relay
162/page

EUCR

Electronic Under Current Relay





EUCR
NLT (No Load Trip)

If the option is on with the load under the minimum detectable current, EUCR will trip

General Description

EUCR Electronic under current relays are designed for faults due to under current...

Protection

Protective Item	Operating (Trip) Time
Under Current	U-TIME

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Reset Time	R-TIME	Automatic reset delay wait time.
Operating Time	U-TIME	Under current run time. Set less than the motor's endurance time with under current.
Rated Current	Load	Set under-current value

Manual / Electric Reset

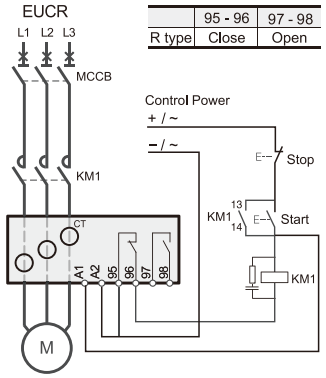
Press the RESET button or turn off the power (A1,A2)-. Remote Reset is possible to install the SW on afar.

TEST Instruction

With test button hold down,the red LED is on and the product will trip after U-TIME.
The relay will be de-energized when RESET button is pushed or the control power is disconnected.
(If the NLT switch is in the OFF, the relay automatically resets after R-TIME)

LED Indication

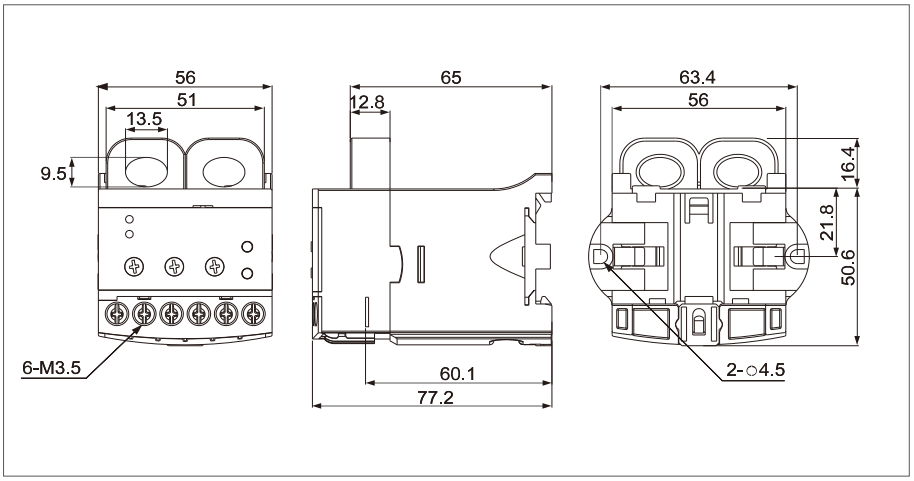
Condition		PWR(Green)LED	Trip(Orange)LED	Remarks
Power	NLT On	○	○	◑:Blink
	NLT Off	◑	×	
Normal Running		○	×	○:ON
Trip		×	○	×:OFF
Auto Reset		×	◑	



	95 - 96	97 - 98
R type	Close	Open

Specifications

Current Setting		Type	Range
		05	0.5 ~ 6A
		30	3 ~ 30A
		60	5 ~ 60A
TIME	Reset	R-TIME	0.5 ~ 120sec.+Off
	Operation	U-TIME	0.5 ~ 30sec.
Reset			Manual / Electric Reset
Indicator			LED
Accuracy		Current	±10%
		Time	±15%
Control Voltage	Voltage Range	S	AC/DC 24~240V
		220	AC 90 ~ 260V
		440	AC180 ~ 460V
	Frequency		50/60Hz
Output	Contact		2-STDT(1NO1NC)
	Condition		When powered, 95⊣⊢96 Close ,97⊣ ⊢98 Open
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight			170gr.



Ordering

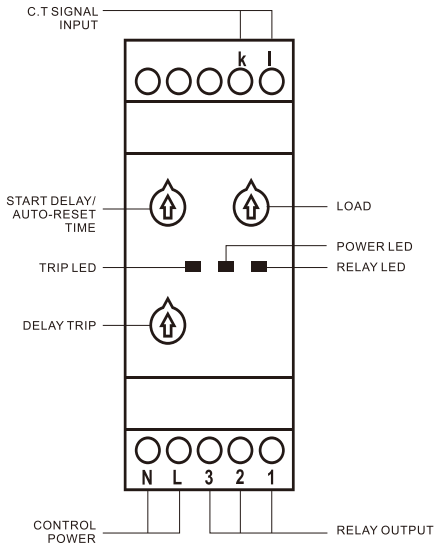
E U C R - 0 5 - 2 2 0

① ② ③

①	Model		
②	Current	05	0.5 ~ 6A
		30	3 ~ 30A
		60	5 ~ 60A
③	Power Supply	S	AC/DC 24 ~ 240V,50/60Hz
		220	AC90 ~ 260VAC,50/60Hz
		440	AC180 ~ 460VAC,50/60Hz

AKR-01D

Electronic Auto-Reset Under Current Relay



General Description

AKR-01D Electronic auto-reset under current relay are designed to prevent loads from being damaged due to under current.

Function

Protective Item	Operating (Trip)time
Under Current	DT

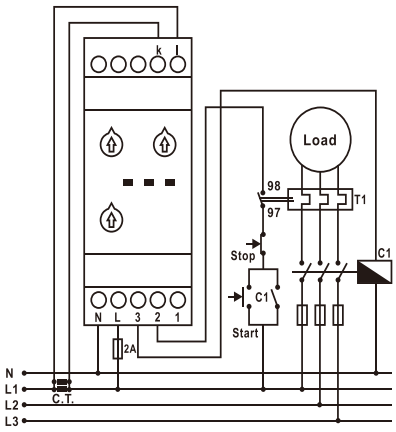
Set

Classification	Set Knob	Set up
Start Delay Auto-Reset	ST	Sets the start (inrush current) time.
Delay Trip	DT	Sets the under current fault waiting time.
Rated Curent	A<	Under current set value=(Under current value of load/current transformer value)*5 Example: If the under current value to be adjusted is 100A and the current transformer value used is 250/5A, the under current set value will be set as 100A when A> button is taken to the 2 stage. Under current set value=(100/250)*5=2

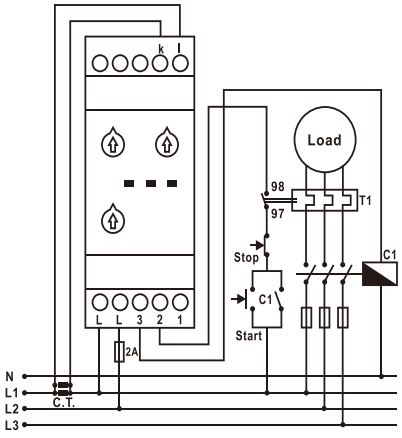
LED Indication

Condition	A<(Red)	ON(Green)	OUT(Red)	Remarks
Power	×	○	○	○:ON ×:OFF
Normal Running	×	○	○	
Trip	○	○	×	

A< Led: Error Indication
ON Led: Power Indication
OUT Led: Relay output Indication



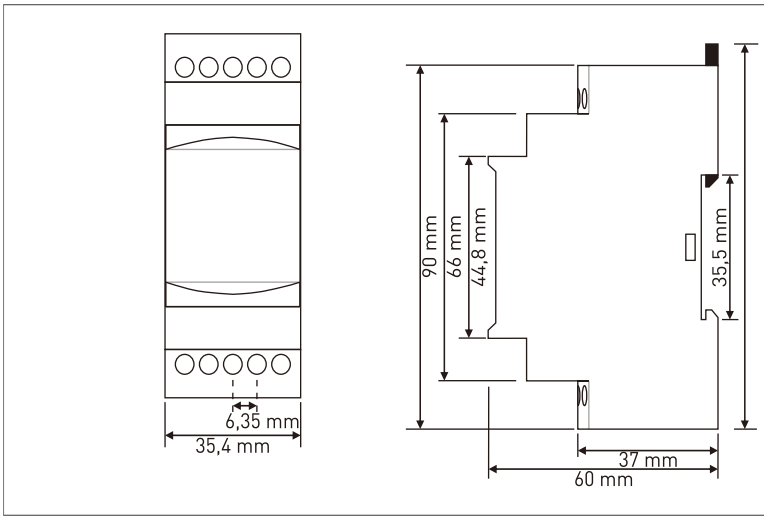
※ For L-N Connection diagram



※ For L-L Connection diagram

Specifications

Current Setting		Type	Range
		01D	5 ~ 250/5A
TIME	Start Delay	ST	1 ~ 10sec.
	Auto Reset/Delay Trip	DT	0.5 ~ 2.5sec.
Reset			Auto reset
Indicator			LED
Accuracy		Current	±10%
		Time	±15%
Control Voltage	Voltage Range	24	AC/DC 24V
		110	AC 110V
		220	AC 150 ~ 260V
		380	AC 380V
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When normal running 2┤ ├3 close, 1┤ ├2 open
			When Trip 2┤ ├3 open, 1┤ ├2 close
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			120gr.



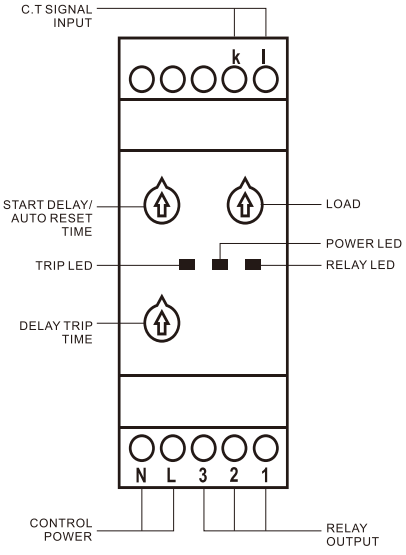
Ordering

A	K	R	-	0	1	D	-	2	2	0
①				②				③		

①	Model		
②	Current	01D	5 ~ 250/5A
③	Control Voltage	24	24VAC/DC,50/60Hz
		110	110VAC,50/60Hz
		220	150 ~ 260VAC,50/60Hz
		380	380VAC,50/60Hz

AKR-XXU

Electronic Auto-Reset Under Current Relay(Included C.T)



General Description

AKR-XXU Electronic Auto-reset under current relay are designed to prevent loads from being damaged due to under current.

Function

Protective Item	Operating (Trip)time
Under Current	DT

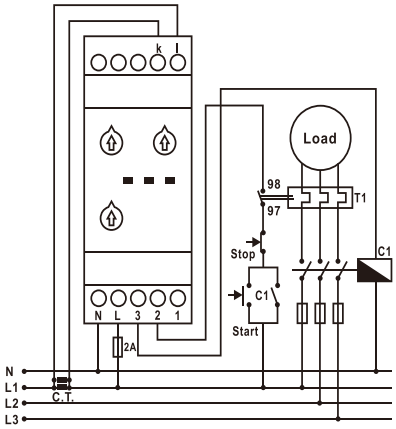
Set

Classification	Set Knob	Set up
Start Delay Auto-Reset	ST	Sets the start (inrush current) time.
Delay Trip	DT	Sets the under current fault waiting time.
Rated Curent	A<	Under current set value

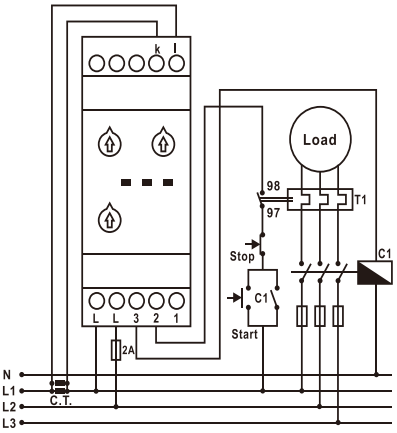
LED Indication

Condition	A<(Red)	ON(Green)	OUT(Red)	Remarks
Power	×	○	○	○:ON ×:OFF
Normal Running	×	○	○	
Trip	○	○	×	

A< Led: Error Indication
ON Led: Power Indication
OUT Led: Relay output Indication



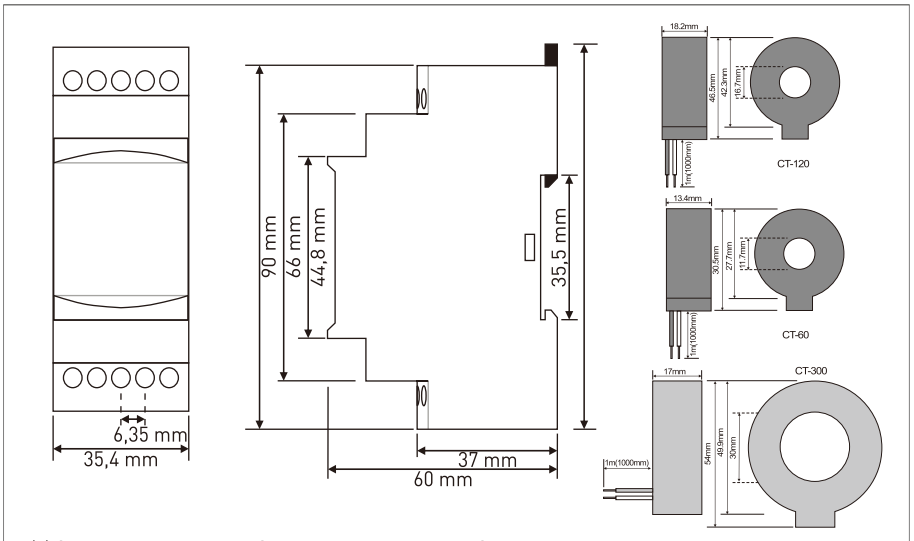
※ For L-N Connection diagram



※ For L-L Connection diagram

Specifications

Current Setting		Type	Range
		60U	1 ~ 63A
		100U	10 ~ 100A
		250U	10 ~ 250A
TIME	Start Delay	ST	1 ~ 10 sec.
	Auto Reset/Delay Trip	DT	0.5 ~ 2.5 sec.
Reset			Auto reset
Indicator			LED
Accuracy		Current	±10%
		Time	±15%
Control Voltage	Voltage Range	24	AC/DC 24V
		110	AC 110V
		220	AC 150 ~ 260V
		380	AC 380V
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When normal running 2┤ ├3 close, 1┤ ├2 open
			When Trip 2┤ ├3 open, 1┤ ├2 close
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<120gr.(60U); <160gr.(100U); <170gr.(250U)



※ CT-60 With AKR-60U, CT-120 with AKR-100U, CT-300 with AKR-250U

Ordering

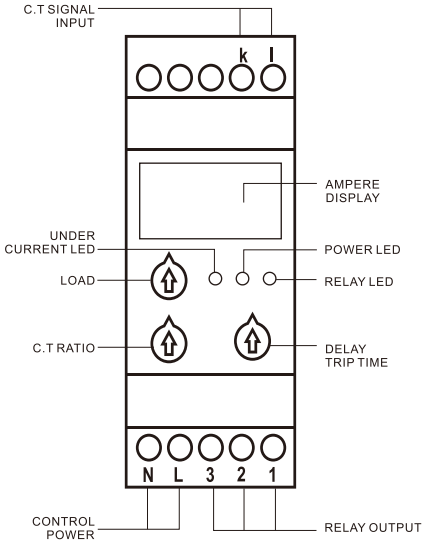
A K R - 6 0 U - 2 2 0

① ② ③

①	Model		
②	Current	60U	1 ~ 63A
		100U	10 ~ 100A
		250U	10 ~ 250A
③	Control Voltage	24	24VAC/DC,50/60Hz
		110	110VAC,50/60Hz
		220	150 ~ 260VAC,50/60Hz
		380	380VAC,50/60Hz

DAKR-01

Digital Auto-Reset Under Current Relay



General Description

DAKR Auto-reset under current relays are designed to prevent loads from being damaged due to under current.

Function

Protective Item	Operating (Trip)time
Under Current	<t> time setting

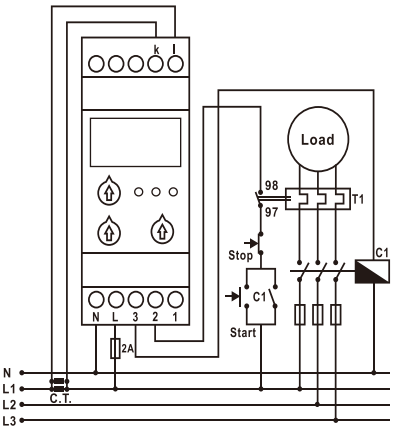
Set

Classification	Set Knob	Set up
Sets the under current fault waiting time	T	Sets the under current fault waiting time
Current ratio setting	....x5	Set the C.T ratio(MAX 250A)
Rated Current	A	Set the under current rated

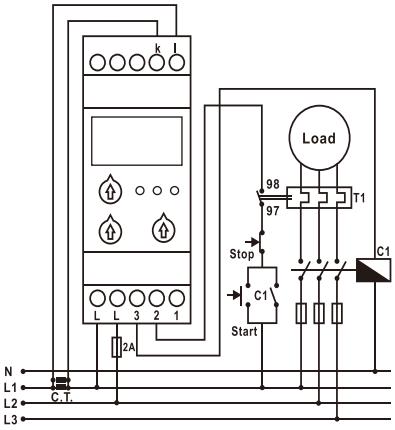
LED Indication

Condition	A<(Red)	ON(Red)	OUT(Green)	Remarks
Power	×	○	○	○:ON ×:OFF
Normal Running	×	○	○	
Trip	○	○	×	

A< Led: Error Indication
ON Led: Power Indication
OUT Led: Relay output Indication



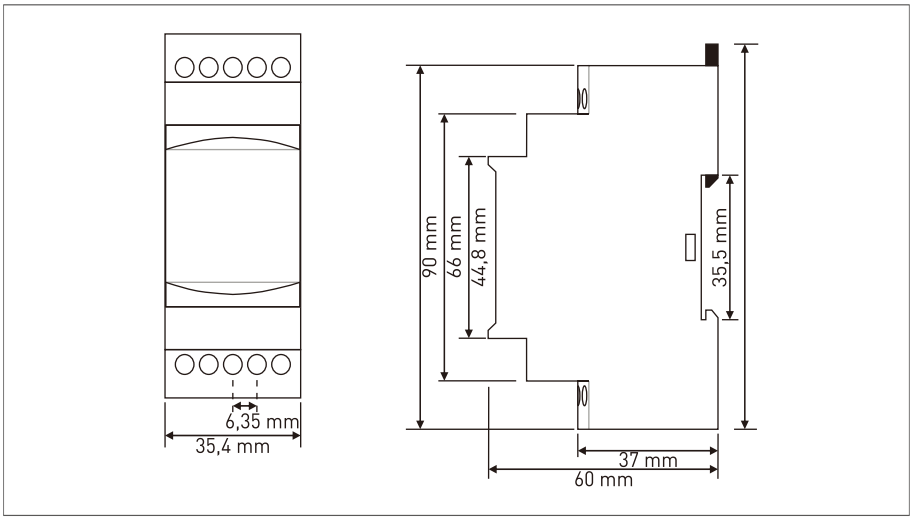
※ For L-N Connection diagram



※ For L-L Connection diagram

Specifications

Current Setting		Type	Range
		01	0.5A ~ 5A AC ...../5A current transformer
TIME	Delay Trip	DT	0.1 ~ 20 sec.
Reset			Auto reset
Indicator			Digital
Accuracy		Current	±1%
		Time	±1%
Control Voltage	Voltage Range	24	AC/DC 24V
		110	AC 110V
		220	AC 150 ~ 260V
		380	AC 380V
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When normal running 2┤ ├3 close, 1┤ ├2 open
			When Trip 2┤ ├3 open, 1┤ ├2 close
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			130gr.



Ordering

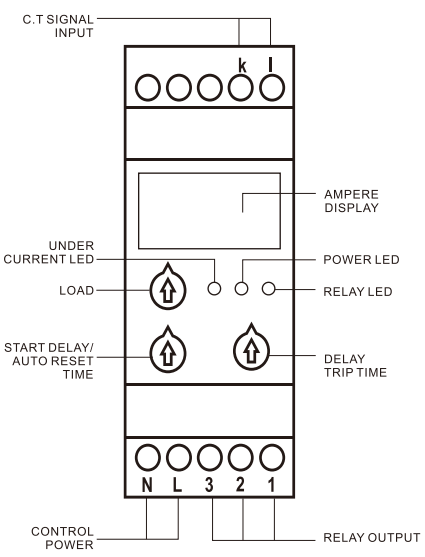
D A K R - 0 1 - 2 2 0

① ② ③

①	Model		
②	Current	01	5 ~ 250/5A
③	Control Voltage	24	24VAC/DC,50/60Hz
		110	110VAC,50/60Hz
		220	150 ~ 260VAC,50/60Hz
		380	380VAC,50/60Hz

DAKR-XXU

Digital Auto-Reset Under Current Relay(Included C.T)



General Description

DAKR Auto-reset under current relay are designed to prevent loads from being damaged due to under current.

Function

Protective Item	Operating (Trip)time
Under Current	DT

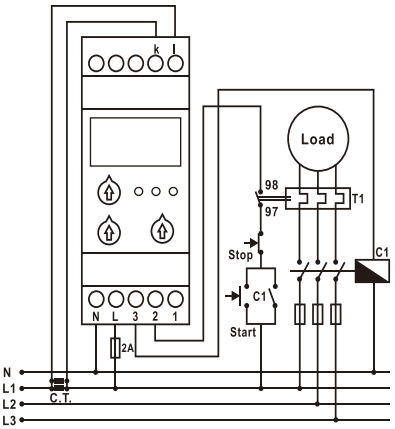
Set

Classification	Set Knob	Set up
Start Delay Auto-Reset	ST	Sets the start (inrush current) time.
Delay Trip	DT	Sets the under current fault waiting time.
Rated Curent	A<	Under current set value

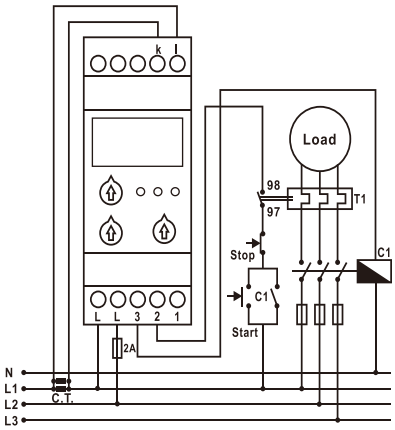
LED Indication

Condition	A>(Red)	ON(Red)	OUT(Green)	Remarks
Power	×	○	○	○:ON ×:OFF
Normal Running	×	○	○	
Trip	○	○	×	

A< Led: Error Indication
ON Led: Power Indication
OUT Led: Relay output Indication



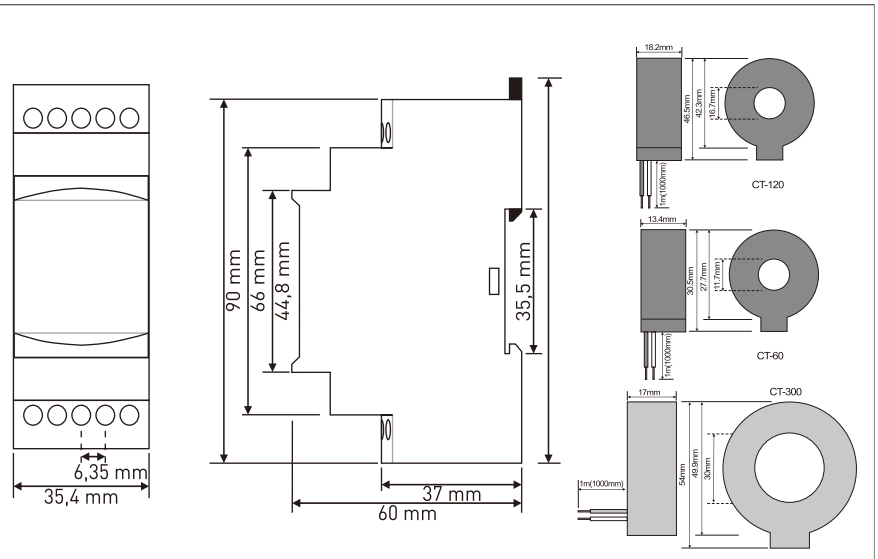
※ For L-N Connection diagram



※ For L-L Connection diagram

Specifications

Current Setting		Type	Range
		60U	1 ~ 63A
		100U	10 ~ 100A
		250U	10 ~ 250A
TIME	Start Delay	ST	0.1 ~ 20 sec.
	Auto Reset/Delay Trip	DT	0.1 ~ 20 sec.
Reset			Auto reset
Indicator			Digital
Accuracy		Current	±1%
		Time	±1%
Control Voltage	Voltage Range	24	AC/DC 24V
		110	AC 110V
		220	AC 150 ~ 260V
		380	AC 380V
	Frequency		50/60Hz
Output	Contact		1-SPDT(1c)
	Condition		When normal running 2┤ ├3 close, 1┤ ├2 open
			When Trip 2┤ ├3 open, 1┤ ├2 close
	Contacts		5A / 250VAC Resistive
Electrical life at rated load in Ac1			$1x10^5$
Temperature			-20 ~ +55℃
Mounting			35mm DIN-Rail
Weight			<140gr(60U); <180gr (100U); <190gr(250U).



※ CT-60 With DAKR-60U, CT-120 with DAKR-100U, CT-300 with DAKR-250U

Ordering

D A K R - 6 0 U - 2 2 0

① ② ③

①	Model		
②	Current	60U	1 ~ 63A
		100U	10 ~ 100A
		250U	10 ~ 250A
③	Control Voltage	24	24VAC/DC,50/60Hz
		110	110VAC,50/60Hz
		220	150 ~ 260VAC,50/60Hz
		380	380VAC,50/60Hz

Phase Failure Relay

FKV-XX (Non Neutral)
Electronic Phase Failure Relay
168/page

FKV-XXN (With Neutral)
Electronic Phase Failure Relay
170/page

FK-XX (Non Neutral)
Electronic Phase Failure Relay
172/page

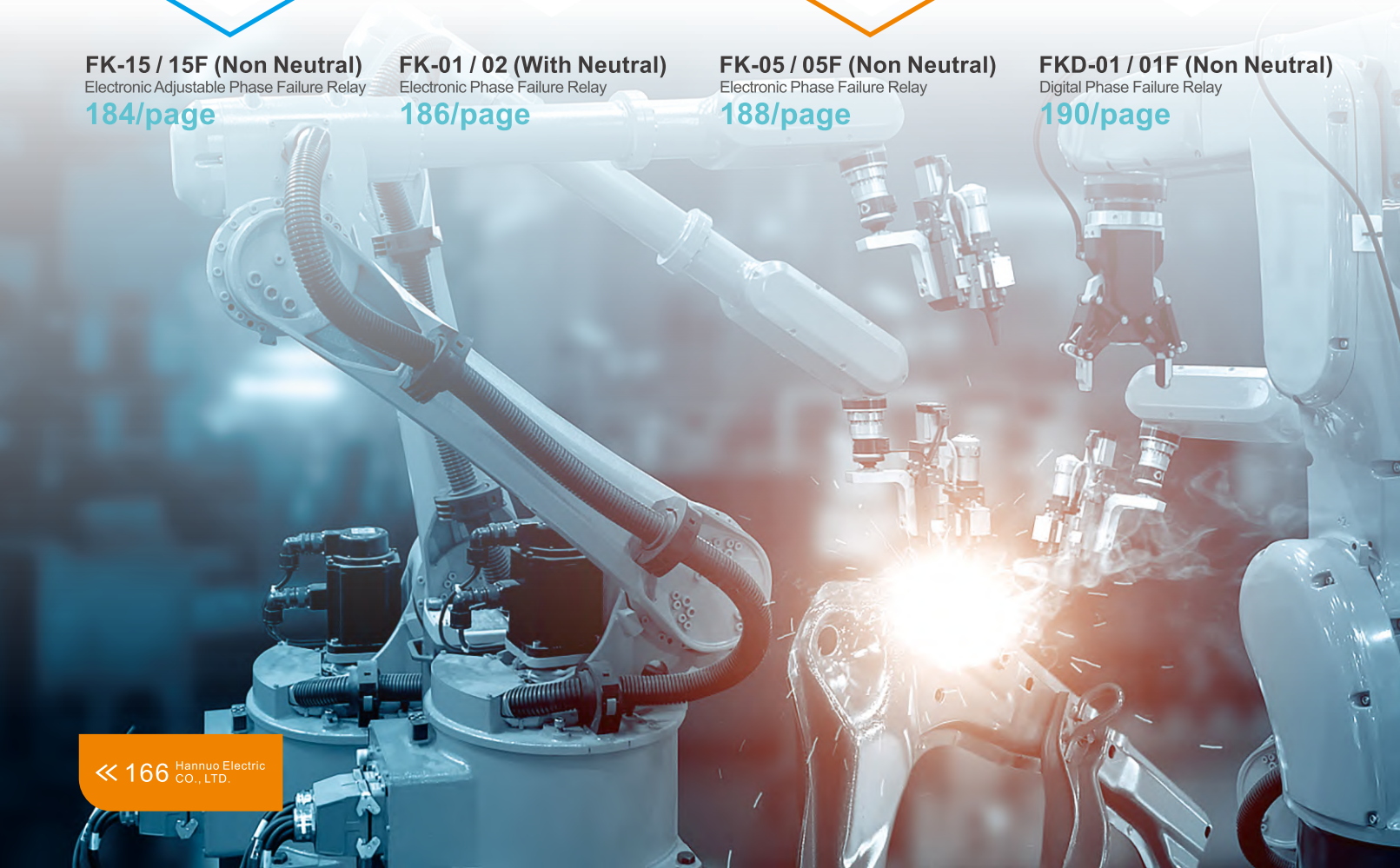
FK-XXN (With Neutral)
Electronic Phase Failure Relay
174/page

FK-15 / 15F (Non Neutral)
Electronic Adjustable Phase Failure Relay
184/page

FK-01 / 02 (With Neutral)
Electronic Phase Failure Relay
186/page

FK-05 / 05F (Non Neutral)
Electronic Phase Failure Relay
188/page

FKD-01 / 01F (Non Neutral)
Digital Phase Failure Relay
190/page



FKS-XX (Non Neutral)
Electronic Phase Failure Relay
176/page

FKS-XXN (With Neutral)
Electronic Phase Failure Relay
178/page

XJ3-G (Non Neutral)
Electronic Phase Failure Relay
180/page

FKM-05 / FKM-05F
Electronic Adjustable Phase Failure Relay
182/page

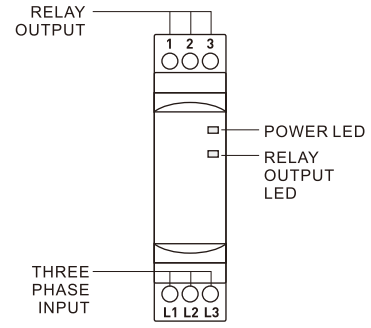
DFK-05 / 05F (Non Neutral)
Digital Phase Failure Relay
192/page

DFS-01 / 01F (Non Neutral)
Digital Phase Failure Relay
194/page

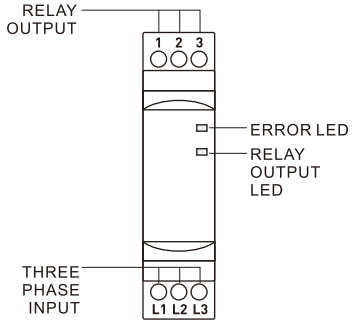
DFS-05/05F (Non Neutral)
Digital Phase Failure Relay
196/page

FKV-XX (Non Neutral)

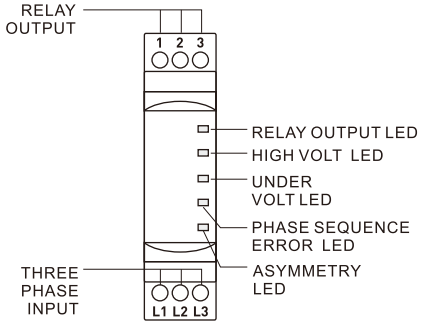
Electronic Phase Failure Relay



※ For FKV-03,FKV-11,FKV-12



※ For FKV-14



※ For FKV-24F

General Description

FKV-XX Phase failure relay is designed to avoid any failure of a three-phase motor caused by a phase failure (phase sequence).

Protection

Protective Item	Item				
Model	FKV-03	FKV-11	FKV-12	FKV-14	FKV-24F
Asymmetry	%40	%30	%40	%30	%11
Under Volt	-	-	-	-	180V
High Volt	-	-	-	-	500V
Phase Sequency	√	-	-	√	√

Auto Reset

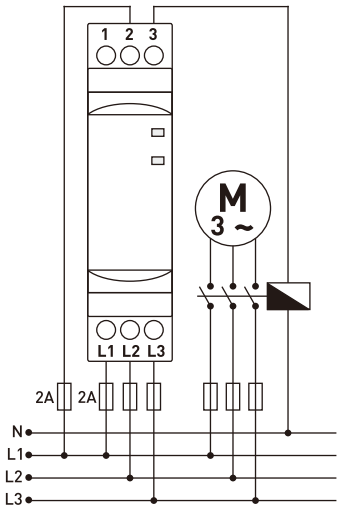
When the fault is eliminated, FKV is automatically reset.

LED Indication

Model	Condition	ON(Red)LED	OUT(Green)LED	Remarks
FKV-03 FKV-11 FKV-12	Normal Running	○	○	○:ON ×:OFF
	Trip	○	×	

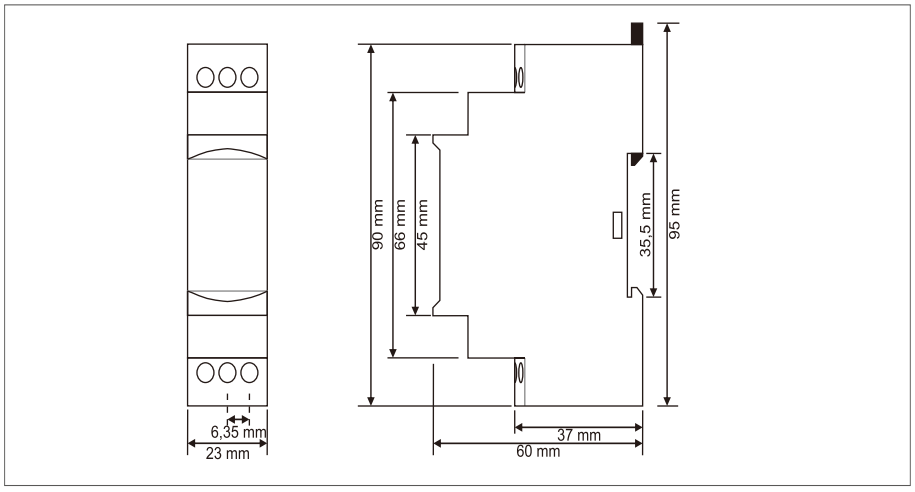
Model	Condition	ERR(Red)LED	OUT(Green)LED	Remarks
FKV-14	Normal Running	×	○	◑:Blink ○:ON ×:OFF
	Asymmetry	◑	×	
	Trip	○	×	

Model	Condition	OUT(Green) LED	U>(Red) LED	U<(Red) LED	X1(Red) LED	Asym(Red) LED	Remarks
FKV-24F	Normal Running	○	×	×	×	×	○:ON ×:OFF
	High Volt	×	○	×	×	×	
	Under Volt	×	×	○	×	×	
	Phase Sequency	×	×	×	○	×	
	Asymmetry	×	×	×	×	○	



Specifications

Type	Model	Function
	FKV-03	Asym: %40, Phase Sequency
	FKV-11	Asym: %30
	FKV-12	Asym: %40
	FKV-14	Asym: %30, Phase Sequency
	FKV-24F	Asym: %11, U>: 500VAC, U<: 180VAC, Phase Sequency
Time	Trip delay	0.2sec.(FKV-24F: 2sec.)
	Auto reset	0.2sec.(FKV-24F: 2sec.)
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢3 close,
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<90gr.



Ordering

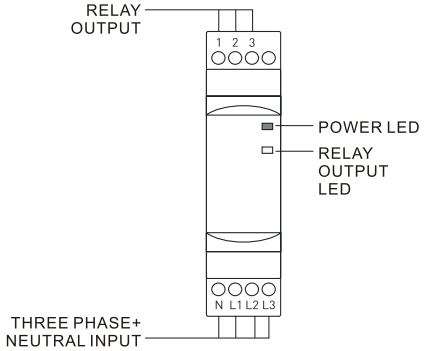
F K V - 0 3

① ②

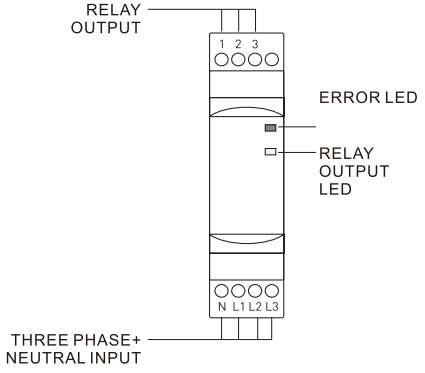
①	Type		
②	Model	03	Asym: %40, Phase Sequency
		11	Asym: %30
		12	Asym: %40
		14	Asym: %30, Phase Sequency
		24F	Asym: %11, U>: 500VAC, U<: 180VAC, Phase Sequency

FKV-XXN (With Neutral)

Electronic Phase Failure Relay



※ For FKV-03N,FKV-11N,FKV-12N



※ For FKV-14N

General Description

FKV-XXN Phase failure relay is designed to avoid any failure of a three-phase motor caused by a phase failure (phase sequence).

Protection

Protective Item	Item			
Model	FKV-03N	FKV-11N	FKV-12N	FKV-14N
Asymmetry	%40	%30	%40	%30
Phase Sequency	√	-	-	√

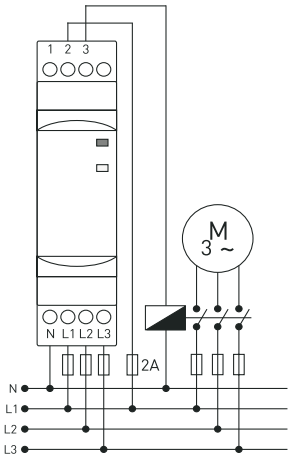
Auto Reset

When the fault is eliminated, FKV is automatically reset.

LED Indication

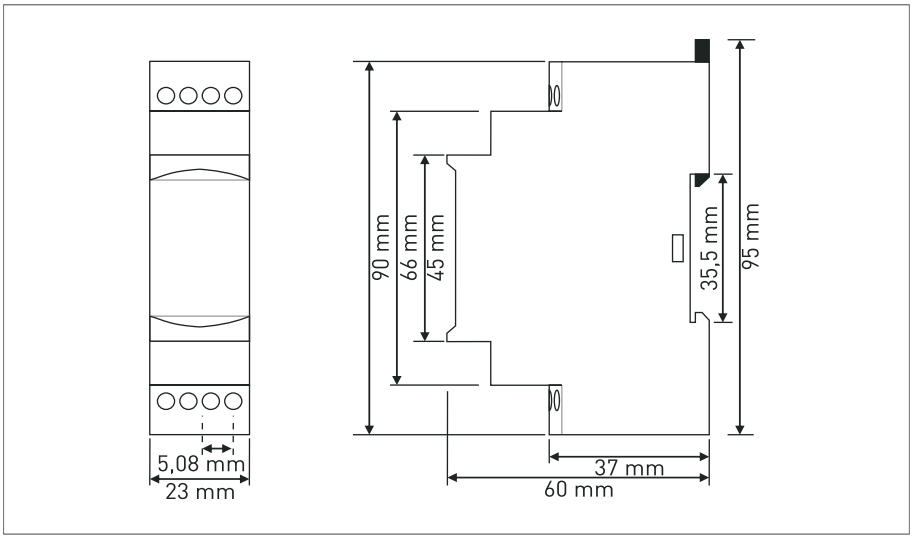
Model	Condition	ON(Red)LED	OUT(Green)LED	Remarks
FKV-03N FKV-11N FKV-12N	Normal Running	○	○	○:ON ×:OFF
	Trip	○	×	

Model	Condition	ERR(Red)LED	OUT(Green)LED	Remarks
FKV-14N	Normal Running	×	○	◑:Blink ○:ON ×:OFF
	Asymmetry	◑	×	
	Trip	○	×	



Specifications

Type	Model	Function
	FKV-03N	Asym: %40, Phase Sequency
	FKV-11N	Asym: %30
	FKV-12N	Asym: %40
	FKV-14N	Asym: %30, Phase Sequency
Time	Trip delay	0.2sec.
	Auto reset	0.2sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC+Neutral
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢ 3 close,
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<90gr.



Ordering

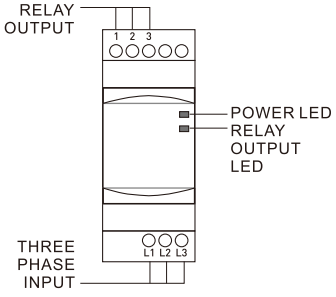
F K V - 0 3 N

① ②

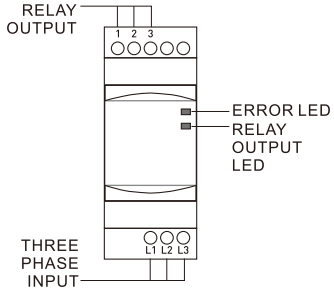
①	Type		
②	Model	03N	Asym: %40, Phase Sequency
		11N	Asym: %30
		12N	Asym: %40
		14N	Asym: %30, Phase Sequency

FK-XX (Non Neutral)

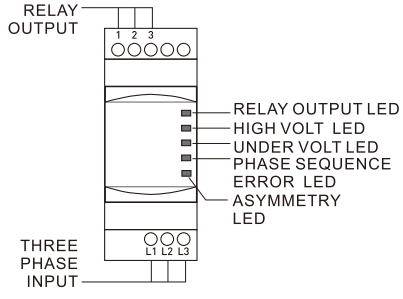
Electronic Phase Failure Relay



※ For FK-03,FK-11,FK-12



※ For FK-14



※ For FK-24F

General Description

FK-XX Phase failure relay is designed to avoid any failure of a three-phase motor caused by a phase failure (phase sequence).

Protection

Protective Item	Item				
Model	FK-03	FK-11	FK-12	FK-14	FK-24F
Asymmetry	%40	%30	%40	%30	%11
Under Volt	-	-	-	-	180V
High Volt	-	-	-	-	500V
Phase Sequency	√	-	-	√	√

Auto Reset

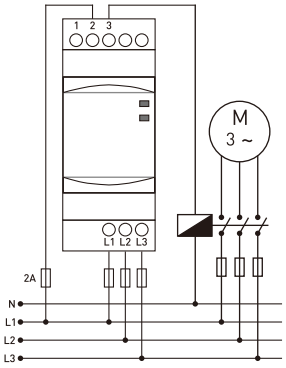
When the fault is eliminated, FK is automatically reset.

LED Indication

Model	Condition	ON(Red)LED	OUT(Green)LED	Remarks
FK-03 FK-11 FK-12	Normal Running	○	○	○:ON ×:OFF
	Trip	○	×	

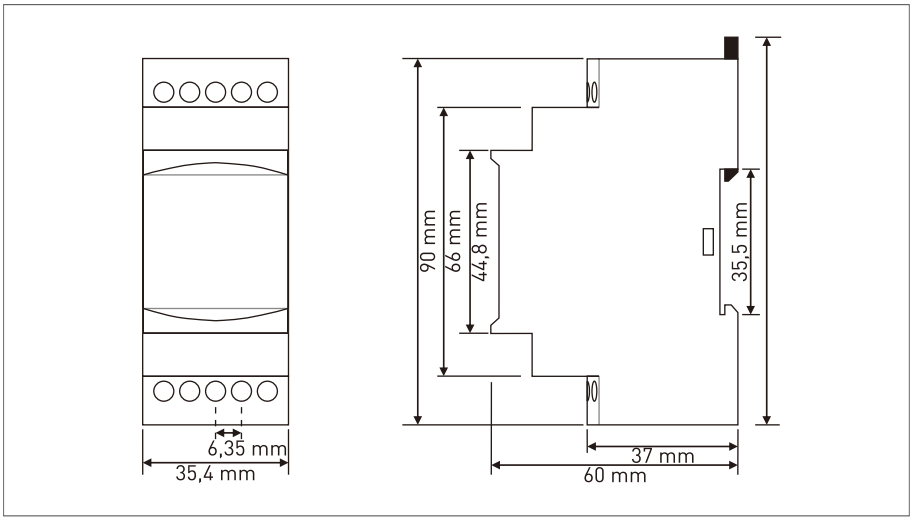
Model	Condition	ERR(Red)LED	OUT(Green)LED	Remarks
FK-14	Normal Running	×	○	◑:Blink ○:ON ×:OFF
	Asymmetry	◑	×	
	Trip	○	×	

Model	Condition	OUT(Green) LED	U>(Red) LED	U<(Red) LED	X1(Red) LED	Asym(Red) LED	Remarks
FK-24F	Normal Running	○	×	×	×	×	○:ON ×:OFF
	High Volt	×	○	×	×	×	
	Under Volt	×	×	○	×	×	
	Phase Sequency	×	×	×	○	×	
	Asymmetry	×	×	×	×	○	



Specifications

Type	Model	Function
	FK-03	Asym: %40, Phase Sequency
	FK-11	Asym: %30
	FK-12	Asym: %40
	FK-14	Asym: %30, Phase Sequency
	FK-24F	Asym: %11, U>: 500VAC, U<: 180VAC, Phase Sequency,
Time	Trip delay	0.2sec.(FK-24F: 2sec.)
	Auto reset	0.2sec.(FK-24F: 2sec.)
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢ 3 close,
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<100gr.



Ordering

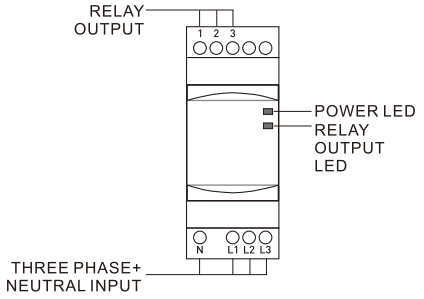
F K - 0 3

① ②

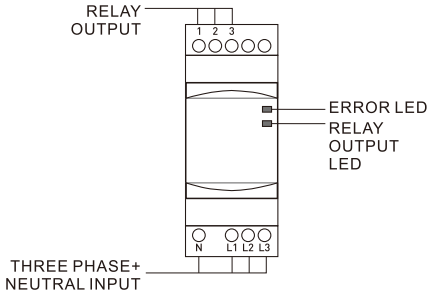
①	Type		
②	Model	03	Asym: %40, Phase Sequency
		11	Asym: %30
		12	Asym: %40
		14	Asym: %30, Phase Sequency
		24F	Asym: %11, U>: 500VAC, U<: 180VAC, Phase Sequency,

FK-XXN (With Neutral)

Electronic Phase Failure Relay



※ For FK-03N,FK-11N,FK-12N



※ For FK-14N

General Description

FK-XXN Phase failure relay is designed to avoid any failure of a three-phase motor caused by a phase failure (phase sequence).

Protection

Protective Item	Item			
Model	FKV-03N	FKV-11N	FKV-12N	FKV-14N
Asymmetry	%40	%30	%40	%30
Phase Sequency	√	-	-	√

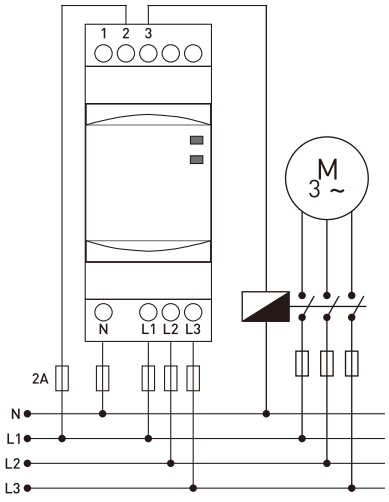
Auto Reset

When the fault is eliminated, FK is automatically reset.

LED Indication

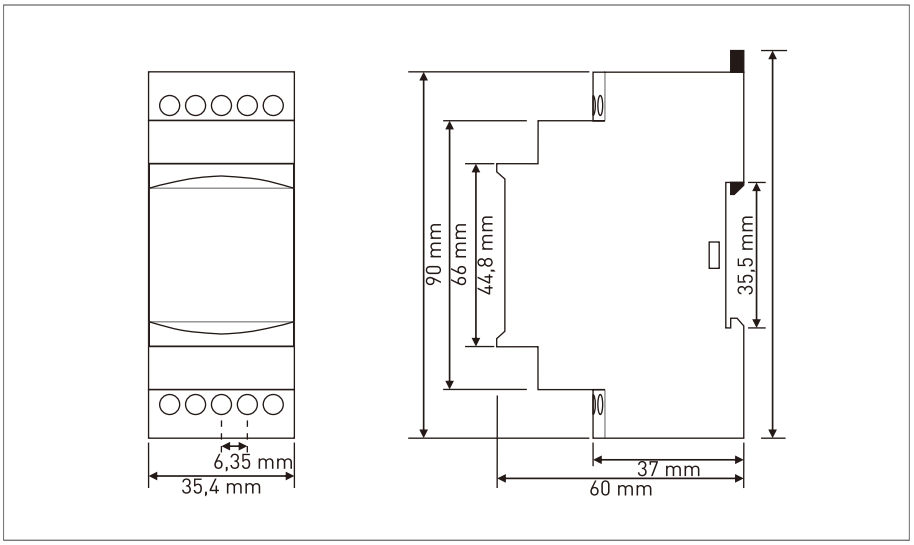
Model	Condition	ON(Red)LED	OUT(Green)LED	Remarks
FK-03N FK-11N FK-12N	Normal Running	○	○	○:ON ×:OFF
	Trip	○	×	

Model	Condition	ERR(Red)LED	OUT(Green)LED	Remarks
FK-14N	Normal Running	×	○	◑:Blink ○:ON ×:OFF
	Asymmetry	◑	×	
	Trip	○	×	



Specifications

Type	Model	Function
	FK-03N	Asym: %40, Phase Sequency
	FK-11N	Asym: %30
	FK-12N	Asym: %40
	FK-14N	Asym: %30, Phase Sequency
Time	Trip delay	0.2sec.
	Auto reset	0.2sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC+Neutral
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊬ 2 open, 2 ⊣ ⊢ 3 close,
		When Trip, 1 ⊣⊬ 2 close, 2 ⊣ ⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<100gr.



Ordering

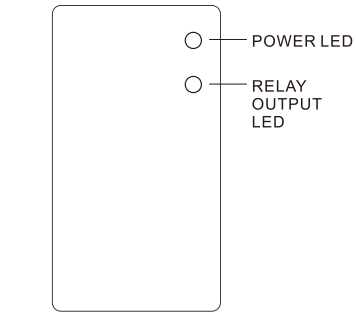
F K - 0 3 N

① ②

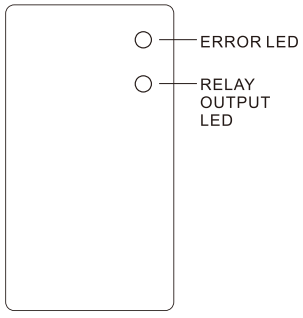
①	Type		
②	Model	03N	Asym: %40, Phase Sequency
		11N	Asym: %30
		12N	Asym: %40
		14N	Asym: %30, Phase Sequency

FKS-XX (Non Neutral)

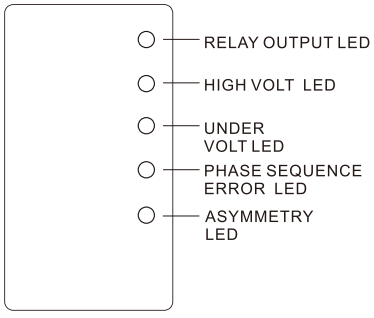
Electronic Phase Failure Relay



※ For FKS-03,FKS-11,FKS-12



※ For FKS-14



※ For FKS-24F

General Description

FKS-XX Phase failure relay is designed to avoid any failure of a three-phase motor caused by a phase failure (phase sequence).

Protection

Protective Item	Item				
Model	FKS-03	FKS-11	FKS-12	FKS-14	FKS-24F
Asymmetry	%40	%30	%40	%30	%11
Under Volt	-	-	-	-	180V
High Volt	-	-	-	-	500V
Phase Sequency	√	-	-	√	√

Auto Reset

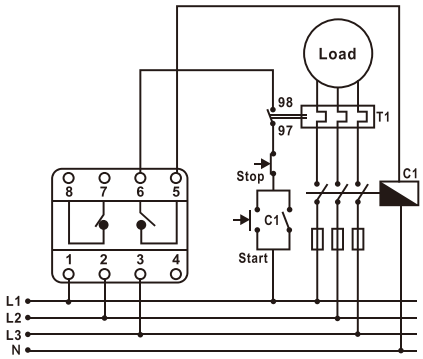
When the fault is eliminated, FKV is automatically reset.

LED Indication

Model	Condition	ON(Red)LED	OUT(Green)LED	Remarks
FKS-03 FKS-11 FKS-12	Normal Running	○	○	○:ON ×:OFF
	Trip	○	×	

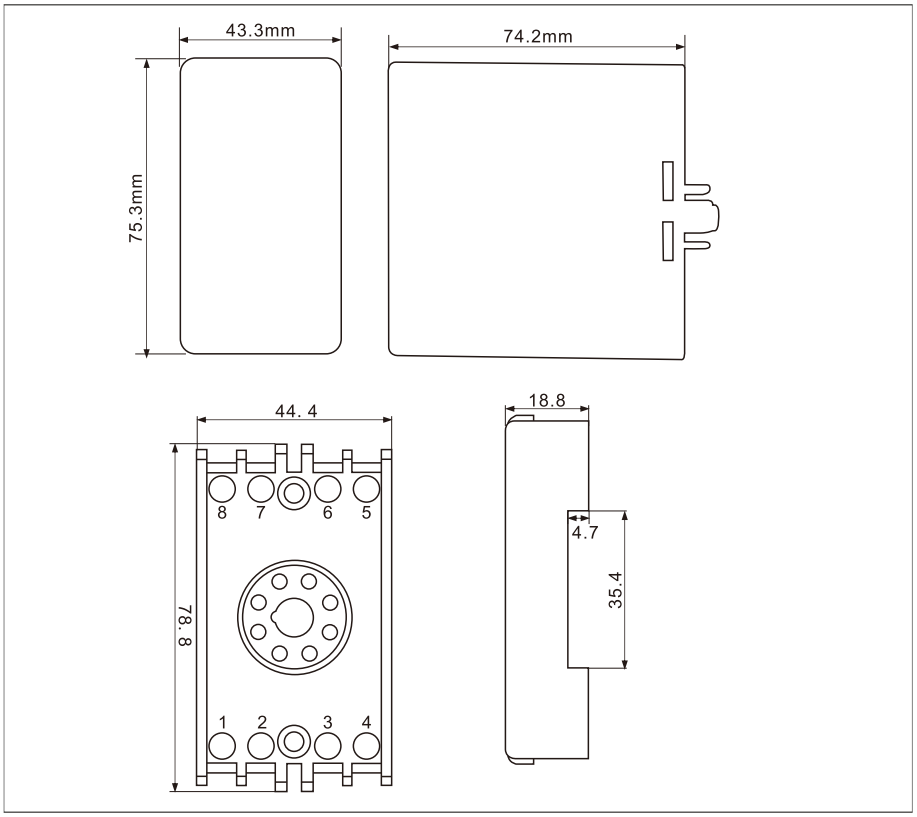
Model	Condition	ERR(Red)LED	OUT(Green)LED	Remarks
FKS-14	Normal Running	×	○	◑:Blink ○:ON ×:OFF
	Asymmetry	◑	×	
	Trip	○	×	

Model	Condition	OUT(Green) LED	U>(Red) LED	U<(Red) LED	X1(Red) LED	Asym(Red) LED	Remarks
FKS-24F	Normal Running	○	×	×	×	×	○:ON ×:OFF
	High Volt	×	○	×	×	×	
	Under Volt	×	×	○	×	×	
	Phase Sequency	×	×	×	○	×	
	Asymmetry	×	×	×	×	○	



Specifications

Type	Model	Function
	FKS-03	Asym: %40, Phase Sequency
	FKS-11	Asym: %30
	FKS-12	Asym: %40
	FKS-14	Asym: %30, Phase Sequency
	FKS-24F	Asym: %11, U>: 500VAC, U<: 180VAC, Phase Sequency,
Time	Trip delay	0.2sec.(FKS-24F: 2sec.)
	Auto reset	0.2sec.(FKS-24F: 2sec.)
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	2-SPDT(1NO1NC)
	Condition	When normal running, 7 ⊣⊢ 8 open, 5 ⊣ ⊢6 close,
		When Trip, 7 ⊣⊢ 8 close, 5 ⊣ ⊢6 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		<180gr.



Ordering

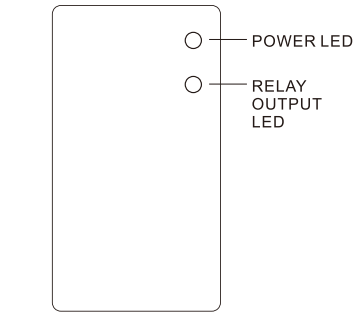
F K S - 0 3

① ②

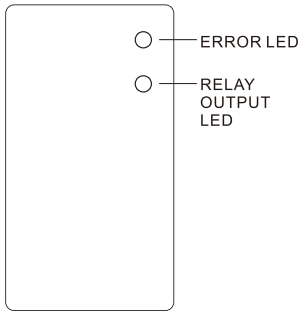
①	Type		
②	Model	03	Asym: %40, Phase Sequency
		11	Asym: %30
		12	Asym3%40
		14	Asym: %30, Phase Sequency
		24F	Asym: %11, U>: 500VAC, U<: 180VAC, Phase Sequency,

FKS-XXN (With Neutral)

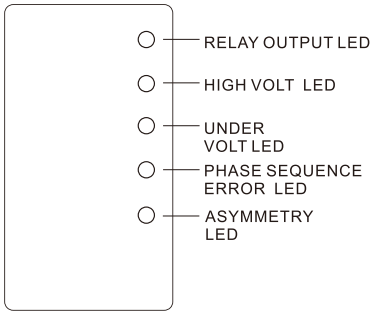
Electronic Phase Failure Relay



※ For FKS-03N,FKS-11N,FKS-12N



※ For FKS-14N



※ For FKS-24FN

General Description

FKS-XXN Phase failure relay is designed to avoid any failure of a three-phase motor caused by a phase failure (phase sequence).

Protection

Protective Item	Item				
Model	FKS-03N	FKS-11N	FKS-12N	FKS-14N	FKS-24FN
Asymmetry	%40	%30	%40	%30	%11
Under Volt	-	-	-	-	180V
High Volt	-	-	-	-	500V
Phase Sequency	√	-	-	√	√

Auto Reset

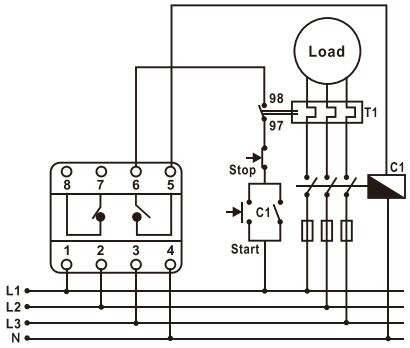
When the fault is eliminated, FKS is automatically reset.

LED Indication

Model	Condition	ON(Red)LED	OUT(Green)LED	Remarks
FKS-03N FKS-11N FKS-12N	Normal Running	○	○	○:ON ×:OFF
	Trip	○	×	

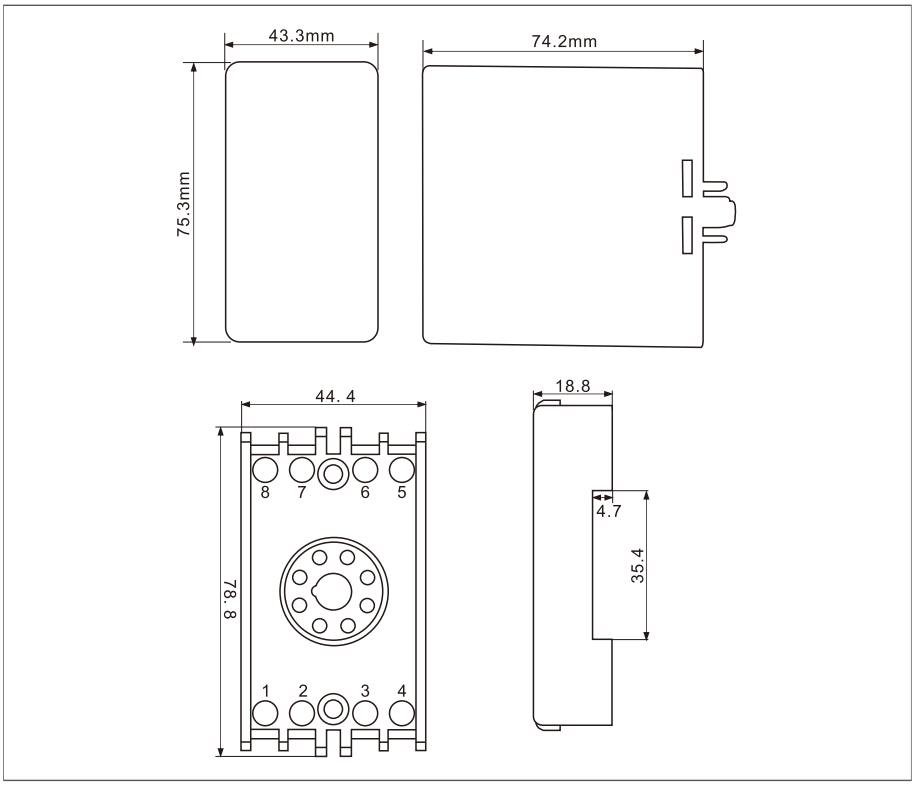
Model	Condition	ERR(Red)LED	OUT(Green)LED	Remarks
FKS-14N	Normal Running	×	○	◑:Blink ○:ON ×:OFF
	Asymmetry	◑	×	
	Trip	○	×	

Model	Condition	OUT(Green) LED	U>(Red) LED	U<(Red) LED	X1(Red) LED	Asym(Red) LED	Remarks
FKS-24FN	Normal Running	○	×	×	×	×	○:ON ×:OFF
	High Volt	×	○	×	×	×	
	Under Volt	×	×	○	×	×	
	Phase Sequency	×	×	×	○	×	
	Asymmetry	×	×	×	×	○	



Specifications

Type	Model	Function
	FKS-03N	Asym: %40, Phase Sequency
	FKS-11N	Asym: %30
	FKS-12N	Asym: %40
	FKS-14N	Asym: %30, Phase Sequency
	FKS-24FN	Asym: %11, U>: 500VAC, U<: 180VAC, Phase Sequency,
Time	Trip delay	0.2sec.(FKS-24FN: 2sec.)
	Auto reset	0.2sec.(FKS-24FN: 2sec.)
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC+Neutral
	Frequency	50/60Hz
Output	Contact	2-SPDT(1NO1NC)
	Condition	When normal running, 7 ⊣⊢ 8 open, 5 ⊣ ⊢6 close,
		When Trip, 7 ⊣⊢ 8 close, 5 ⊣ ⊢6 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		<180gr.



Ordering

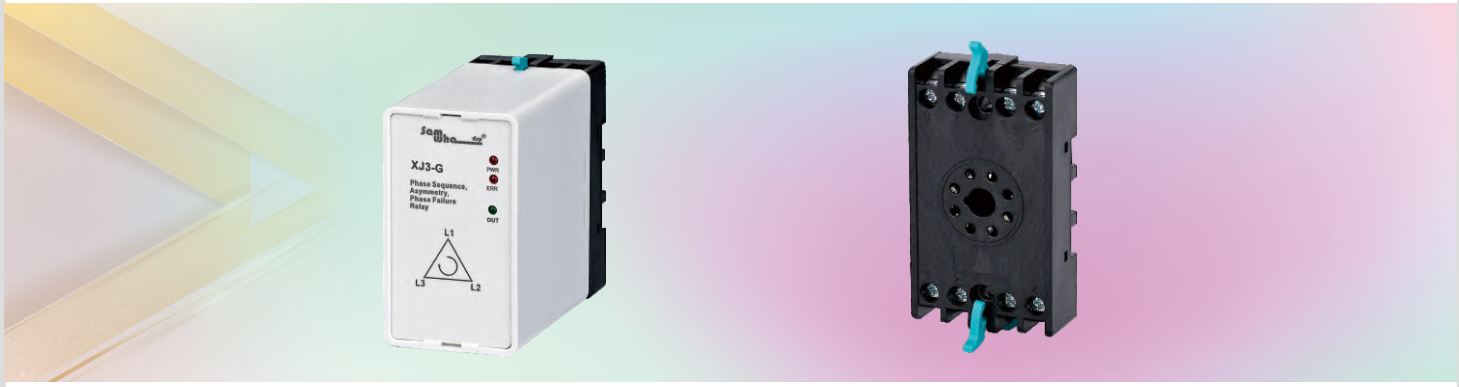
F K S - 0 3 N

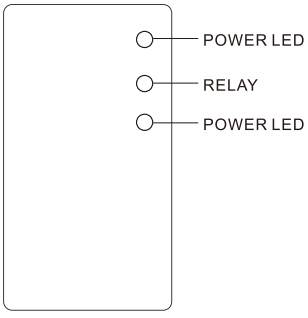
① ②

①	Type		
②	Model	03N	Asym: %40, Phase Sequency
		11N	Asym: %30
		12N	Asym: %40
		14N	Asym: %30, Phase Sequency
		24FN	Asym: %11, U>: 500VAC, U<: 180VAC, Phase Sequency,

XJ3-G (Non Neutral)

Electronic Phase Failure Relay





General Description

XJ3-G Phase failure relay is designed to avoid any failure of a three-phase motor caused by a phase failure (phase sequence).

Protection

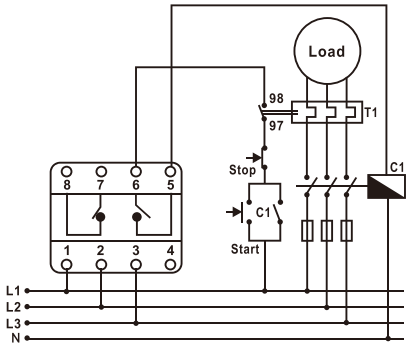
Protective Item	Item
Asymmetry	%7
Phase Sequency	√

Auto Reset

When the fault is eliminated, XJ3-G is automatically reset.

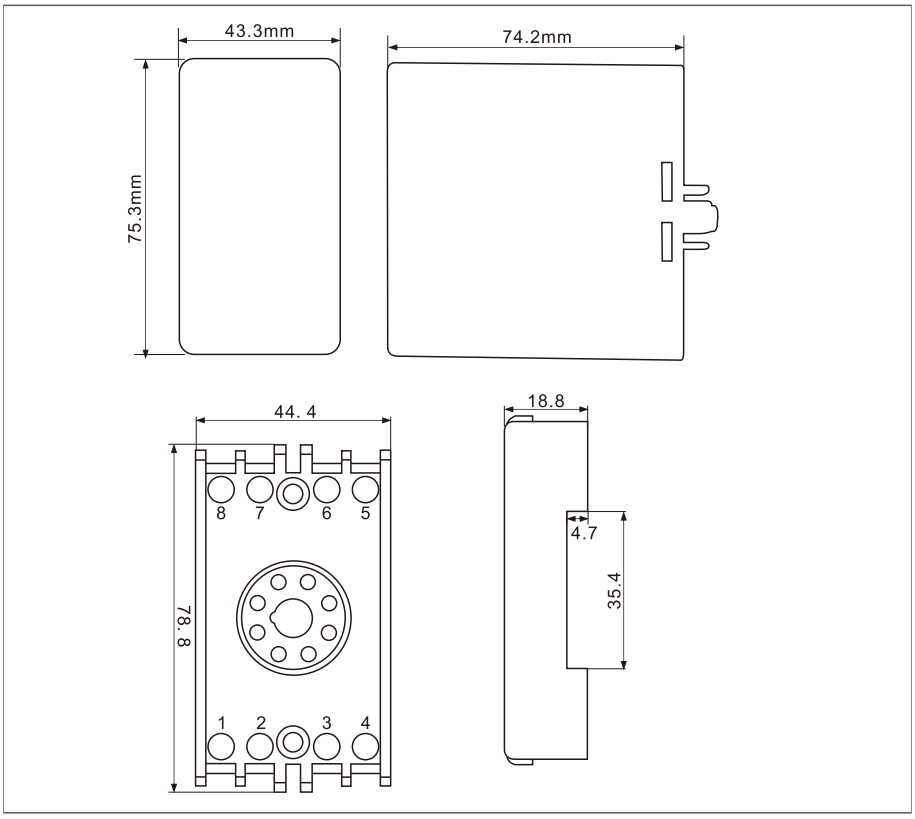
LED Indication

Model	Condition	PWR(Green)LED	ERR(Red)LED	OUT(Green)LED
XJ3-G	Normal Running	○	×	○
	Asymmetry	○	○	×
	Phase Sequency	○	○	×

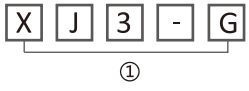


Specifications

Type	Model	Function
	XJ3-G	Asym: %7, Phase Sequency
Time	Trip delay	≤ 3sec.
	Auto reset	≤ 3sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	2-SPDT(1NO1NC)
	Condition	When normal running, 7 ⊣⊢ 8 open, 5 ⊣ ⊢6 close,
		When Trip, 7 ⊣⊢ 8 close, 5 ⊣ ⊢6 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		<180gr.



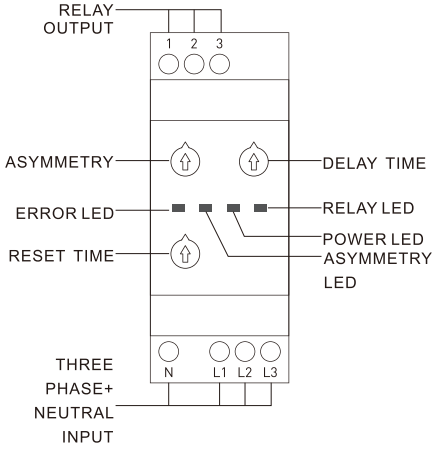
Ordering



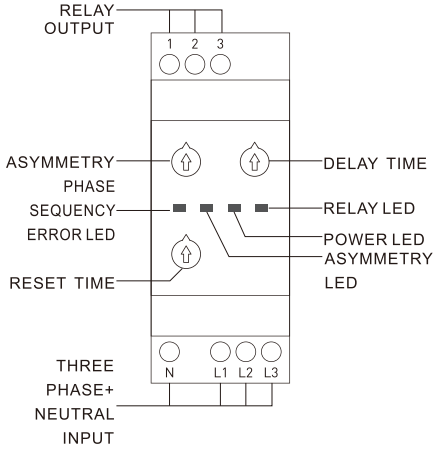
①	Type	Asym: %7, Phase Sequency

FKM-05 / FKM-05F

Electronic Adjustable Phase Failure Relay



※ For FKM-05



※ For FKM-05F

General Description

FKM-XX Asymmetry-adjusted phase protection relays are designed to protect the three-phase motors with sensitive asymmetry values from errors due to mains voltage.

Protection

Protective Item	Item	
Model	FKM-05	FKM-05F
Asymmetry	%5 ~ %25	%5 ~ %25
Under Volt	140VAC	140VAC
High Volt	300VAC	300VAC
Phase Sequency	–	√

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Asymmetry	ASM.	Asymmetry Set Value, ASM LED lights when the difference between voltages is above this value.
Delay Time	DT	Delay Time is the time to wait before entering the asymmetry error.
Reset Time	RT	Reset Time is the time to wait for the relay gets activated when the voltages return to normal.

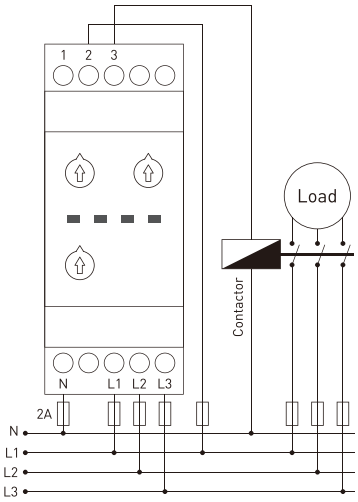
Auto Reset

When the fault is eliminated, FKV is automatically reset.

LED Indication

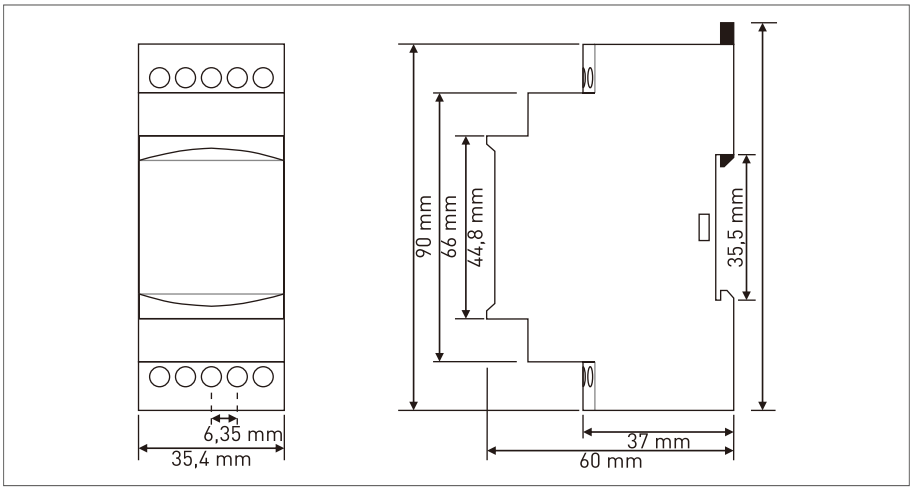
Model	Condition	RELAY (Green)LED	ON (Red)LED	Asm. (Red)LED	ERR. (Red)LED
FKM-05	Normal Running	○	○	×	×
	High Volt	×	○	◑	○
	Under Volt	×	○	◑	○
	Asymmetry	×	○	○	○

Model	Condition	RELAY (Green)LED	ON (Red)LED	Asm. (Red)LED	X1 (Red)LED
FKM-05F	Normal Running	○	○	×	×
	High Volt	×	○	◑	×
	Under Volt	×	○	◑	×
	Asymmetry	×	○	○	×
	Sequency	×	○	×	○



Specifications

Type	Model	Function
	FKM-05	Asym: %5 ~ %25, U>: 300VAC, U<: 140VAC
	FKM-05F	Asym: %5 ~ %25, U>: 300VAC, U<: 140VAC, Phase Sequency
Time	Delay time	0.1sec. ~ 20sec.
	Reset time	0.1sec. ~ 20sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC+Neutral
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢3 close,
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<120gr.



Ordering

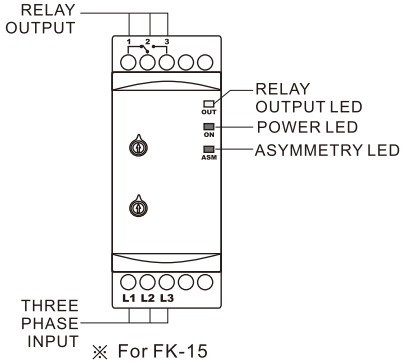
F K M - 0 5

① ②

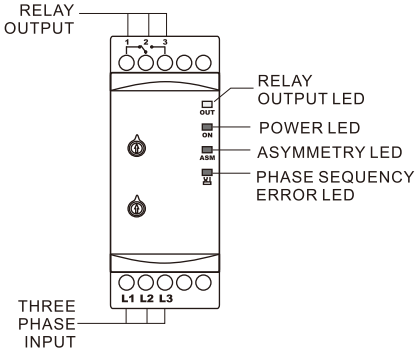
①	Type		
②	Model	05	Asym: %5 ~ %25, U>: 300VAC, U<: 140VAC
		05F	Asym: %5 ~ %25, U>: 300VAC, U<: 140VAC, Phase Sequency

FK-15 / FK-15F (Non Neutral)

Electronic Adjustable Phase Failure Relay



※ For FK-15



※ For FK-15F

General Description

FK-XX Phase failure relay is designed to avoid any failure of a three-phase motor caused by a phase failure (phase sequence).

Protection

Protective Item	Item	
Model	FK-15	FK-15F
Asymmetry	%5 ~ %25	%5 ~ %25
Under Volt	150VAC	150VAC
High Volt	460VAC	460VAC
Phase Sequency	-	√

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Asymmetry	Asym	Asymmetry Set Value, Asym LED lights when the difference between voltages is above this value
Delay/Reset Time	sec.	Time to wait before entering the asymmetry error or wait for the relay gets activated when the voltages return to normal.

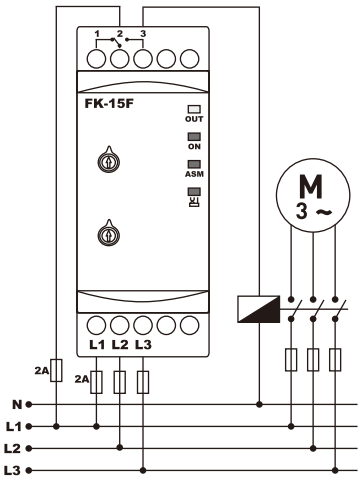
Auto Reset

When the fault is eliminated, FK is automatically reset.

LED Indication

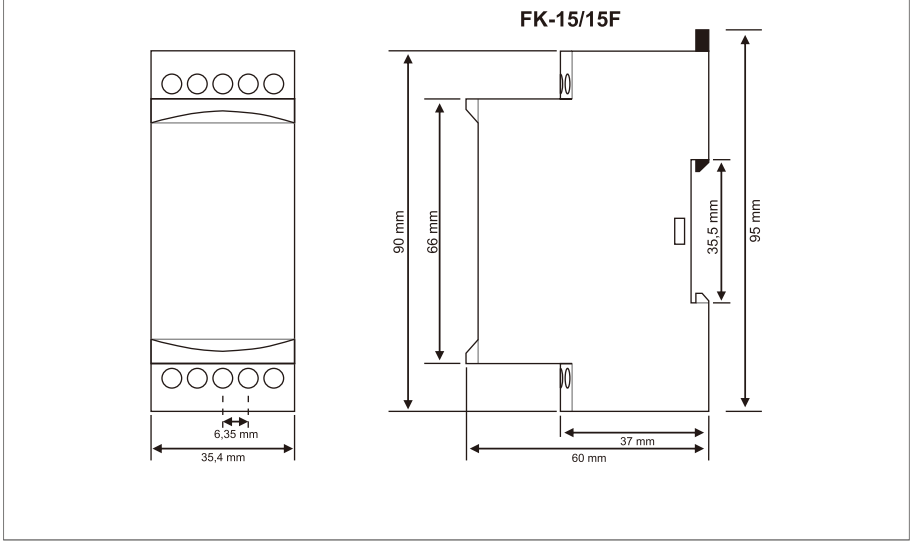
Model	Condition	OUT (Green)LED	ON (Red)LED	Asm. (Red)LED	Remarks
FK-15	Normal Running	○	○	×	○:ON ×:OFF
	High Volt	×	○	×	
	Under Volt	×	○	×	
	Asymmetry	×	○	○	

Model	Condition	OUT (Green)LED	ON (Red)LED	Asm. (Red)LED	X1 (Red)LED	Remarks
FK-15F	Normal Running	○	○	×	×	○:ON ×:OFF
	High Volt	×	○	×	×	
	Under Volt	×	○	×	×	
	Asymmetry	×	○	○	×	
	Sequency	×	○	×	○	



Specifications

Type	Model	Function
	FK-15	Asym: %5 ~ %25,
	FK-15F	Asym: %5 ~ %25, Phase Sequency
Time	Delay / Reset time	0.2~10sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢ 3 close,
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<210gr.



Ordering

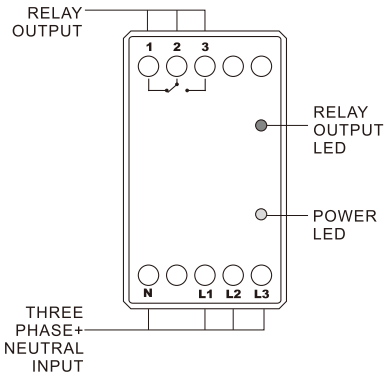
F K - 1 5

① ②

①	Type		
②	Model	15	Asym: %5 ~ %25
		15F	Asym: %5 ~ %25,Phase Sequency

FK-01 / 02 (With Neutral)

Electronic Phase Failure Relay



General Description

FK-XX Phase failure relay is designed to avoid any failure of a three-phase motor caused by a phase failure (phase sequence).

Protection

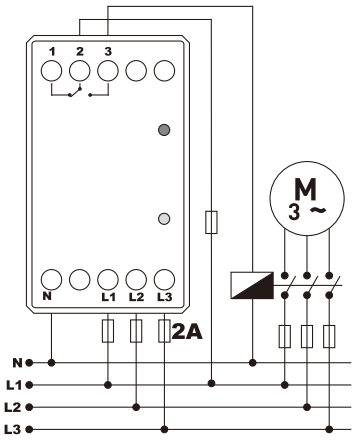
Protective Item	Item	
Model	FK-01	FK-02
Asymmetry	%30	%40

Auto Reset

When the fault is eliminated, FKV is automatically reset.

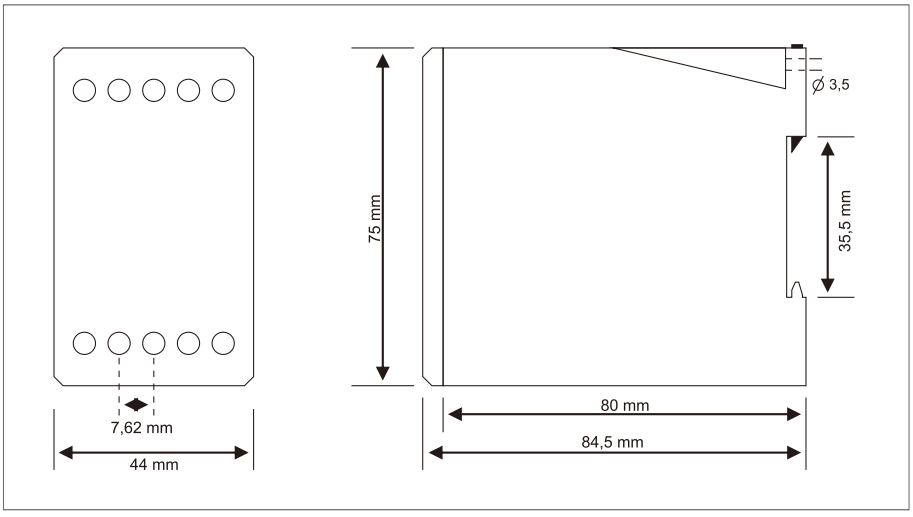
LED Indication

Model	Condition	RLY(Red)LED	PWR(Green)LED	Remarks
FK-01 FK-02	Normal Running	○	○	○:ON ×:OFF
	Trip	×	○	



Specifications

Type	Model	Function
	FK-01	Asym: %30
	FK-02	Asym: %40
Time	Trip delay	0.2sec.
	Auto reset	0.2sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC+Neutral
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⫤⫣ 2 open, 2 ⫤ ⊢3 close,
		When Trip, 1 ⫤⫣ 2 close, 2 ⫤ ⊢3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		<100gr.



Ordering

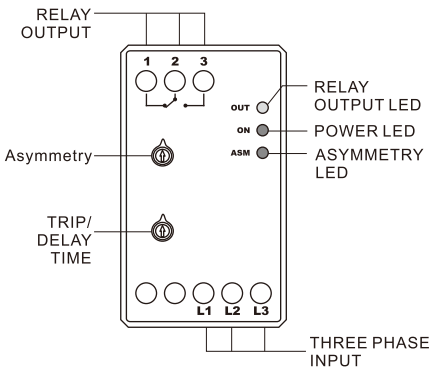
F K - 0 1

① ②

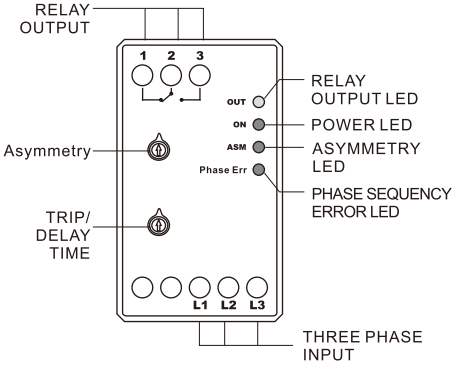
①	Type		
②	Model	01	Asym: %30
		02	Asym: %40

FK-05 / FK-05F (Non Neutral)

Electronic Phase Failure Relay



※ For FK-05



※ For FK-05F

General Description

FK Phase failure relay is designed to avoid any failure of a three-phase motor caused by a phase failure (phase sequence).

Protection

Protective Item	Item	
Model	FK-05	FK-05F
Asymmetry	%5 ~ %25	%5 ~ %25
Under Volt	150VAC	150VAC
High Volt	460VAC	460VAC
Phase Sequency	-	√

Set

After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Asymmetry	Asym	Asymmetry Set Value, Asym LED lights when the difference between voltages is above this value
Delay/Reset Time	sec.	Time to wait before entering the asymmetry error or wait for the relay gets activated when the voltages return to normal.

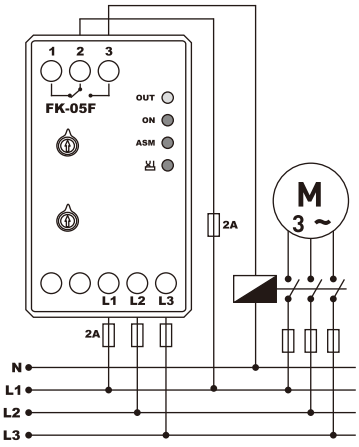
Auto Reset

When the fault is eliminated, FK is automatically reset.

LED Indication

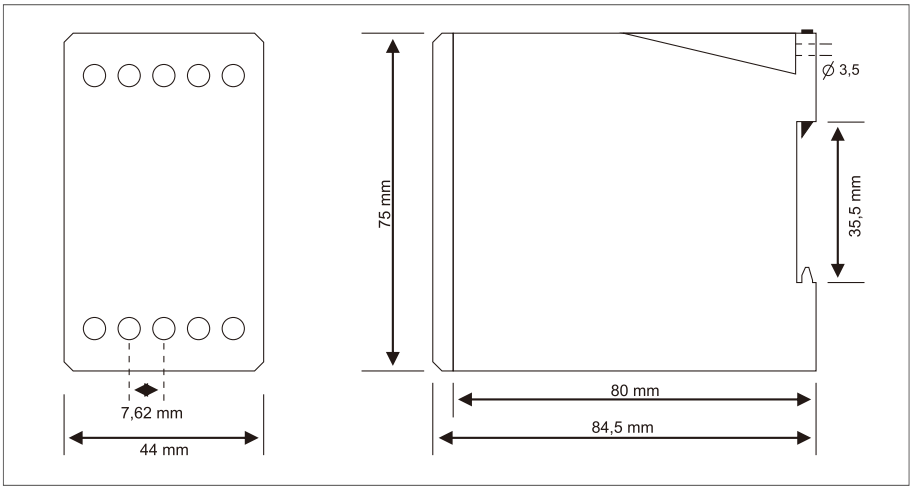
Model	Condition	Rly (Green)LED	Pwr (Red)LED	Asym. (Red)LED	Remarks
FK-05	Normal Running	○	○	×	○:ON ×:OFF
	High Volt	×	○	×	
	Under Volt	×	○	×	
	Asymmetry	×	○	○	

Model	Condition	Rly (Green)LED	Pwr (Red)LED	Asym. (Red)LED	Phase Error (Red)LED	Remarks
FK-05F	Normal Running	○	○	×	×	○:ON ×:OFF
	High Volt	×	○	×	×	
	Under Volt	×	○	×	×	
	Asymmetry	×	○	○	×	
	Sequency	×	○	×	○	



Specifications

Type	Model	Function
	FK-05	Asym.: %5 ~ %25
	FK-05F	Asym.: %5 ~ %25, Phase Sequency
Time	Delay / Reset time	0.1~10sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢ 3 close,
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		230gr.



Ordering

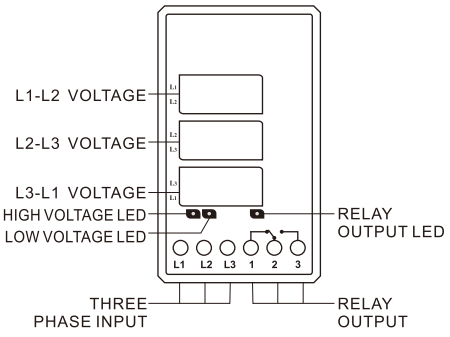
F K - 0 5

① ②

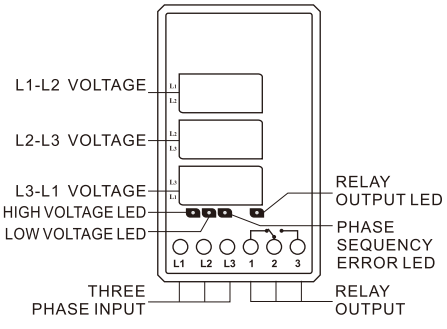
①	Type		
②	Model	05	Asym.: %5 ~ %25
		05F	Asym.: %5 ~ %25, Phase Sequency

FKD-01 / FKD-01F (Non Neutral)

Digital Phase Failure Relay



※ For FKD-01



※ For FKD-01F

General Description

Digital asymmetry adjustable phase protection relays are designed to protect the three-phased motors that is threaten by failures that is originated from network voltages.

Protection

Protective Item	Item	
Model	FKD-01	FKD-01F
Asymmetry	%20	%20
Under Volt	270VAC	270VAC
High Volt	440VAC	440VAC
Phase Sequency		√

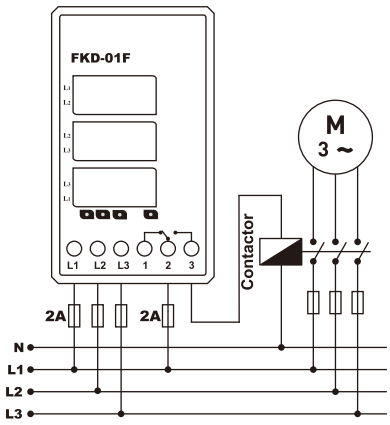
Auto Reset

When the fault is eliminated, after 3 sec. FKD is automatically reset.

LED Indication

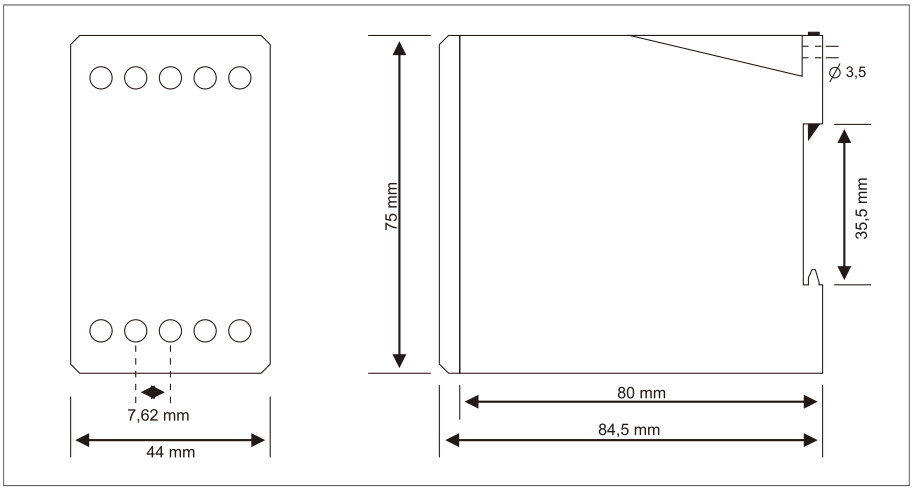
Model	Condition	U>(Red)LED	U<(Red)LED	OUT(Red)LED	Display(Red)LED	Remarks
FKD-01	Normal Running	×	×	○	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	×	◑	
	Low Voltage	×	○	×	◑	
	Asymmetry	×	×	×	◑	

Model	Condition	U>(Red) LED	U<(Red) LED	X1(Red) LED	OUT(Red) LED	Display(Red) LED	Remarks
FKD-01F	Normal Running	×	×	×	○	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	×	×	◑	
	Low Voltage	×	○	×	×	◑	
	Asymmetry	×	×	×	×	◑	
	Phase Sequency Error	×	×	○	×	○	



Specifications

Type	Model	Function
	FKD-01	Asym.: %20, U>: 440VAC, U<: 270VAC
	FKD-01F	Asym.: %20, U>: 440VAC, U<: 270VAC, Phase Sequency
Time	Delay / Reset time	3sec.
Reset		Auto Reset
Indicator		Digital
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢ 3 close,
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		<250gr.



Ordering

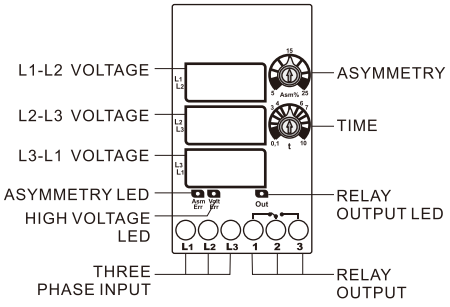
F K D - 0 1

① ②

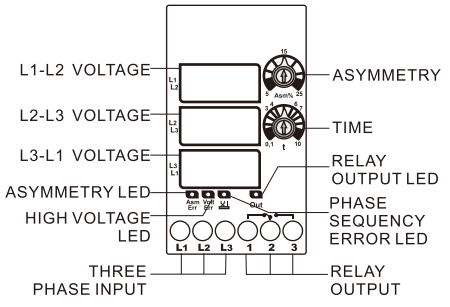
①	Type		
②	Model	01	Asym.: %20, U>: 440VAC, U<: 270VAC
		01F	Asym.: %20, U>: 440VAC, U<: 270VAC, Phase Sequency

DFK-05 / DFK-05F (Non Neutral)

Digital Phase Failure Relay



※ For DFK-05



※ For DFK-05F

General Description

Digital asymmetry adjustable phase protection relays are designed to protect the three-phased motors that is threaten by failures that is originated from network voltages.

Protection

Protective Item	Item	
Model	DFK-05	DFK-05F
Asymmetry	%5 ~ %25	%5 ~ %25
Under Volt	180VAC	180VAC
High Volt	460VAC	460VAC
Phase Sequency		√

Auto Reset

When the fault is eliminated, DFK is automatically reset.

Set

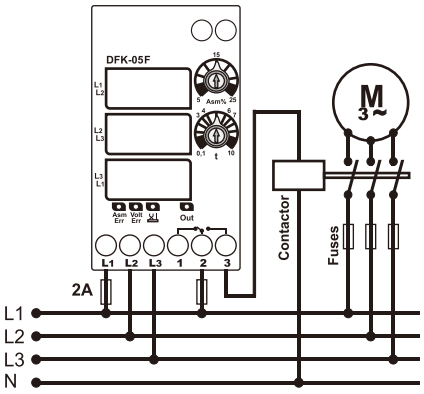
After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Asymmetry	Asm%	Asymmetry Set Value, ASM LED lights when the difference between voltages is above this value
Delay/Reset Time	t	Time to wait before entering the asymmetry error or wait for the relay gets activated when the voltages return to normal.

LED Indication

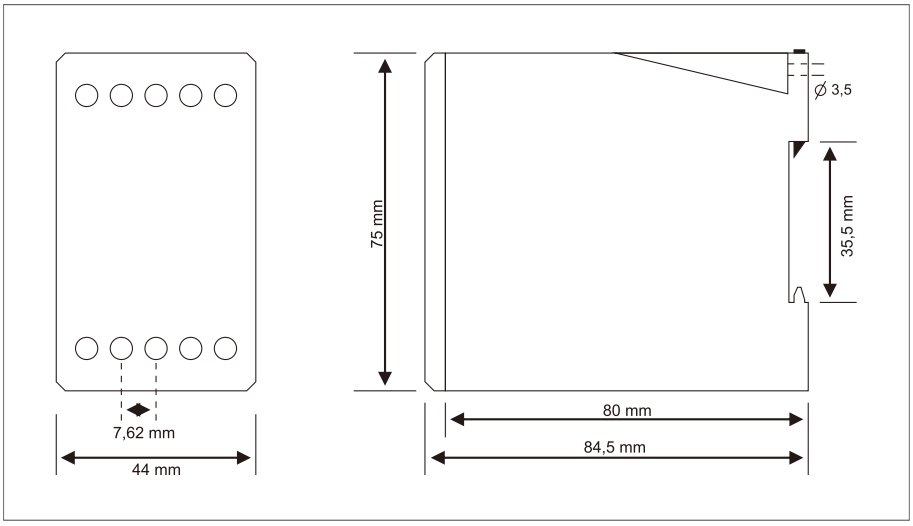
Model	Condition	Asm Err(Red) LED	Volt Err(Red) LED	OUT(Red) LED	Display(Red) LED	Remarks
FKD-05	Normal Running	×	×	○	○	◑:Blink ○:ON ×:OFF
	High Voltage	×	○	×	◑	
	Low Voltage	×	○	×	◑	
	Asymmetry	○	×	×	◑	

Model	Condition	Asm Err (Red)LED	Volt Err (Red)LED	X1(Red) LED	OUT(Red) LED	Display(Red) LED	Remarks
FKD-05F	Normal Running	×	×	×	○	○	◑:Blink ○:ON ×:OFF
	High Voltage	×	○	×	×	◑	
	Low Voltage	×	○	×	×	◑	
	Asymmetry	○	×	×	×	◑	
	Phase Sequency Error	×	×	○	×	○	



Specifications

Type	Model	Function
	FKD-01	Asym.: %5 ~ %20, U>: 460VAC, U<: 180VAC
	FKD-01F	Asym.: %5 ~ %20, U>: 460VAC, U<: 180VAC, Phase Sequency
Time	Delay / Reset time	0.1 ~ 10sec. (Volt Error Delay:3sec.Fixed)
Reset		Auto Reset
Indicator		Digital
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊀⊁ 2 open, 2 ┤├ 3 close,
		When Trip, 1 ⊀⊁ 2 close, 2 ┤├ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		<250gr.



Ordering

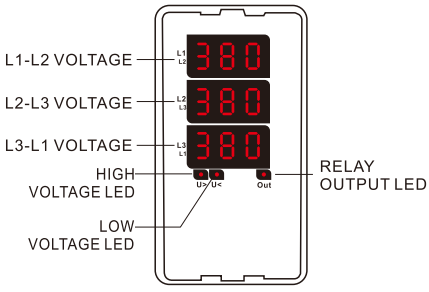
D F K - 0 5

① ②

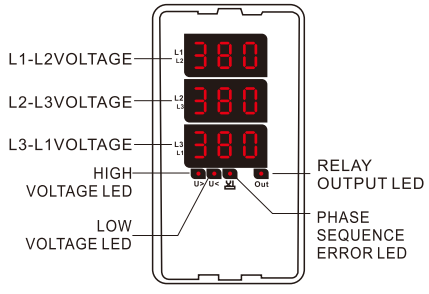
①	Type		
②	Model	05	Asym.: %5 ~ %20, U>: 460VAC, U<: 180VAC
		05F	Asym.: %5 ~ %20, U>: 460VAC, U<: 180VAC, Phase Sequency

DFS-01 / DFS-01F (Non Neutral)

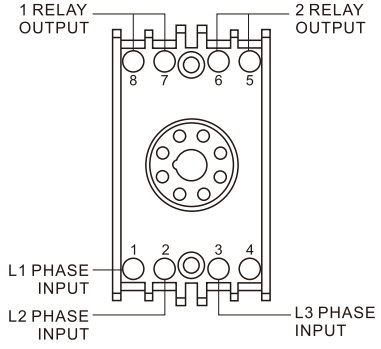
Digital Phase Failure Relay



※ For DFS-01



※ For DFS-01F



General Description

Digital asymmetry adjustable phase protection relays are designed to protect the three-phased motors that is threaten by failures that is originated from network voltages.

Protection

Protective Item	Item	
Model	DFS-01	DFS-01F
Asymmetry	%20	%20
Under Volt	270VAC	270VAC
High Volt	440VAC	440VAC
Phase Sequency		√

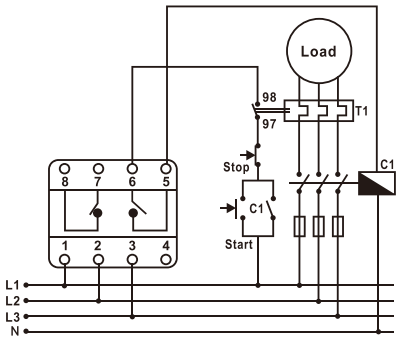
Auto Reset

When the fault is eliminated, DFS is automatically reset.

LED Indication

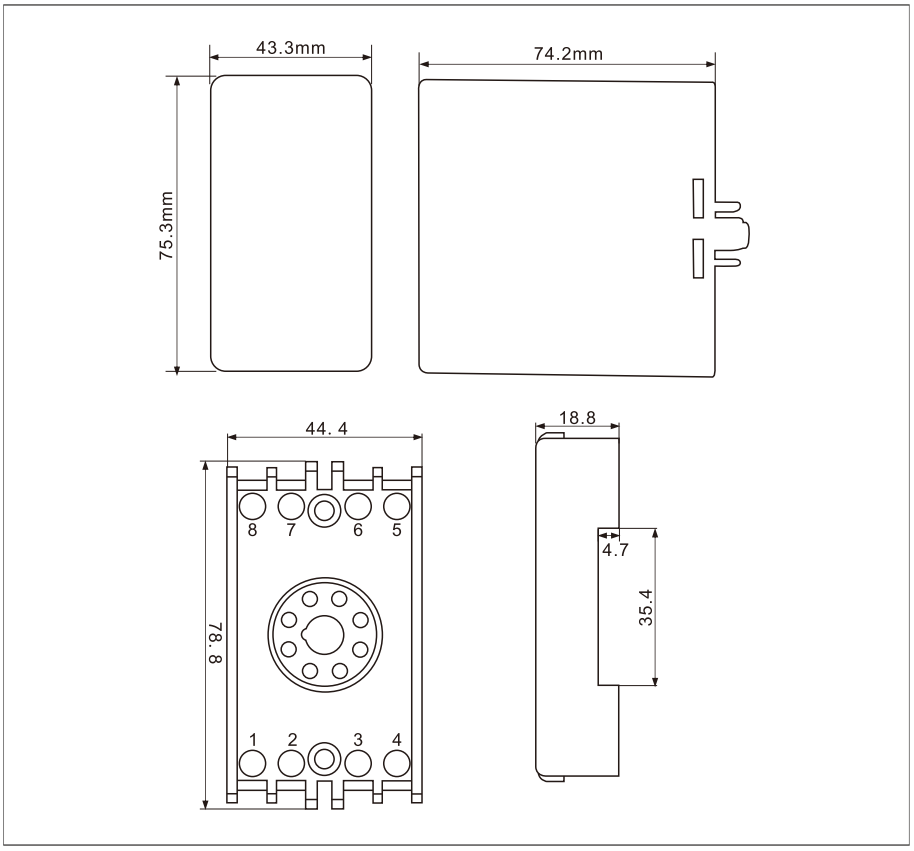
Model	Condition	U>(Red)LED	U<(Red)LED	OUT(Red) LED	Display(Red) LED	Remarks
DFS-01	Normal Running	×	×	○	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	×	◑	
	Low Voltage	×	○	×	◑	
	Asymmetry	×	×	×	◑	

Model	Condition	U>(Red) LED	U<(Red) LED	X1(Red) LED	OUT(Red) LED	Display(Red) LED	Remarks
DFS-01F	Normal Running	×	×	×	○	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	×	×	◑	
	Low Voltage	×	○	×	×	◑	
	Asymmetry	×	×	×	×	◑	
	Phase Sequency Error	×	×	○	×	○	



Specifications

Type	Model	Function
	FKS-01	Asym.: %20, U>: 440VAC, U<: 270VAC
	FKS-01F	Asym.: %20, U>: 440VAC, U<: 270VAC, Phase Sequency
Time	Delay / Reset time	3sec.
Reset		Auto Reset
Indicator		Digital
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	2-SPDT(1NO1NC)
	Condition	When normal running, 7 ⊣⊢ 8 open, 5 ⊣ ⊢6 close,
		When Trip, 7 ⊣⊢ 8 close, 5 ⊣ ⊢6 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		<250gr.



Ordering

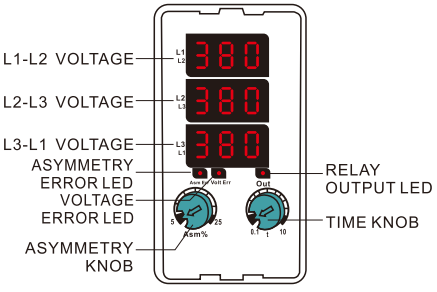
D F S - 0 1

① ②

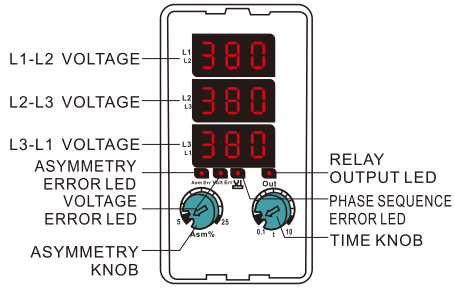
①	Type		
②	Model	01	Asym.: %20, U>: 440VAC, U<: 270VAC
		01F	Asym.: %20, U>: 440VAC, U<: 270VAC, Phase Sequency

DFS-05 / DFS-05F (Non Neutral)

Digital Phase Failure Relay



※ For DFS-05



※ For DFS-05F

General Description

Digital asymmetry adjustable phase protection relays are designed to protect the three-phased motors that is threaten by failures that is originated from network voltages.

Protection

Protective Item	Item	
Model	DFS-05	DFS-05F
Asymmetry	%5 ~ %25	%5 ~ %25
Under Volt	180VAC	180VAC
High Volt	460VAC	460VAC
Phase Sequency		√

Auto Reset

When the fault is eliminated, DFS is automatically reset.

Set

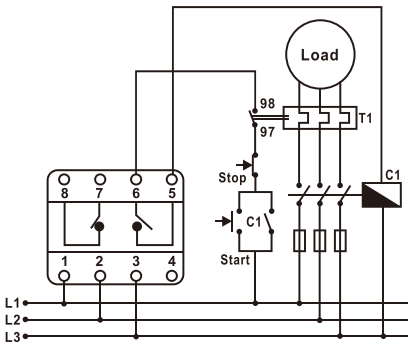
After the installation is complete the settings as follows.

Classification	Set Knob	Set up
Asymmetry	Asm%	Asymmetry Set Value, ASM LED lights when the difference between voltages is above this value
Delay/Reset Time	t	Time to wait before entering the asymmetry error or wait for the relay gets activated when the voltages return to normal.

LED Indication

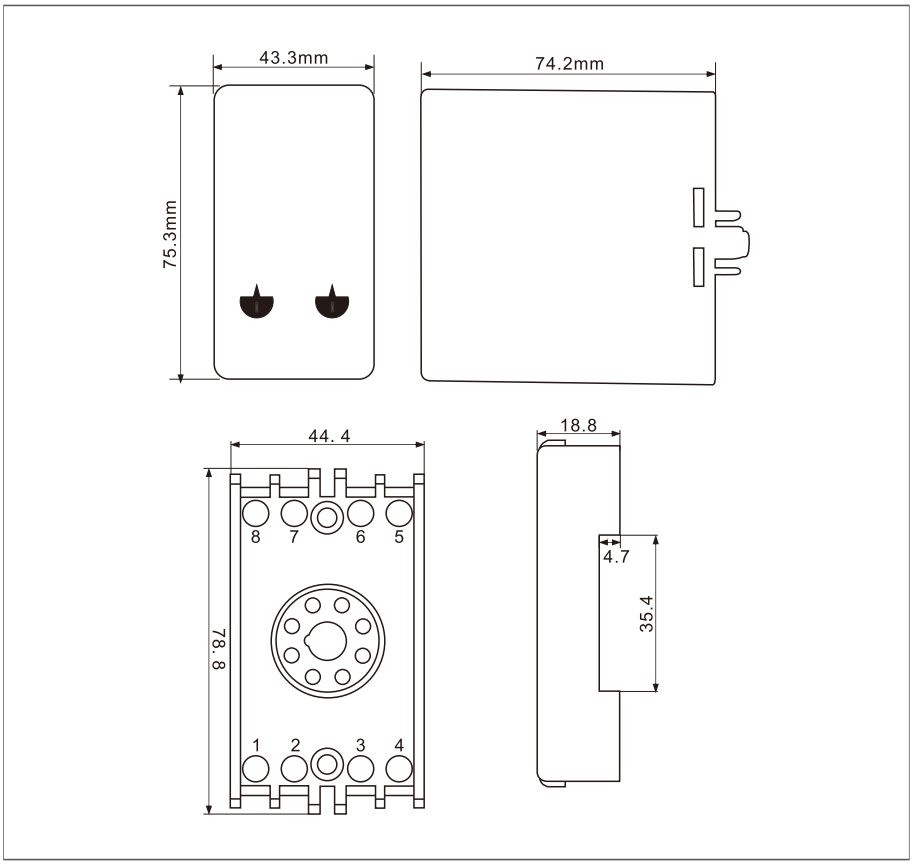
Model	Condition	Asm Err(Red) LED	Volt Err(Red) LED	OUT(Red) LED	Display(Red) LED	Remarks
DFS-05	Normal Running	×	×	○	○	◑:Blink ○:ON ×:OFF
	High Voltage	×	○	×	◑	
	Low Voltage	×	○	×	◑	
	Asymmetry	○	×	×	◑	

Model	Condition	Asm Err (Red)LED	Volt Err (Red)LED	X1(Red) LED	OUT(Red) LED	Display(Red) LED	Remarks
DFS-05F	Normal Running	×	×	×	○	○	◑:Blink ○:ON ×:OFF
	High Voltage	×	○	×	×	◑	
	Low Voltage	×	○	×	×	◑	
	Asymmetry	○	×	×	×	◑	
	Phase Sequency Error	×	×	○	×	○	



Specifications

Type	Model	Function
	DFS-05	Asym.: %5 ~ %20, U>: 460VAC, U<: 180VAC
	DFS-05F	Asym.: %5 ~ %20, U>: 460VAC, U<: 180VAC, Phase Sequency
Time	Delay / Reset time	0.1~10sec. (Volt Error Delay:3sec.Fixed)
Reset		Auto Reset
Indicator		Digital
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	2-SPDT(1NO1NC)
	Condition	When normal running, 7 ⊣⊢ 8 open, 5 ⊣ ⊢6 close,
		When Trip, 7 ⊣⊢ 8 close, 5 ⊣ ⊢6 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		<320gr.



Ordering

D F S - 0 5

① ②

①	Type		
②	Model	05	Asym.: %5 ~ %20, U>: 460VAC, U<: 180VAC
		05F	Asym.: %5 ~ %20, U>: 460VAC, U<: 180VAC, Phase Sequency

Voltage Control Relay

UVR-01
Mono Phase Under Voltage Control Relay
200/page

UVR-21
Three Phase Under Voltage Control Relay
202/page

UVR-11
Mono Phase Over And Under Voltage Control Relay
204/page

GKV-12/12F (With Neutral)
Three Phase Over And Under Voltage Control Relay
206/page

GKT-03 /03F (Non Neutral)
Three Phase Over And Under Voltage Control Relay
216/page

GKT-05/05F (3x220VAC) (Non Neutral)
Three Phase Over And Under Voltage Control Relay
218/page

GK-12N /13N (With Neutral)
Three Phase Voltage Control Relay
220/page

GK-14N / 14FN (With Neutral)
Three Phase Over And Under Voltage Control Relay
222/page

GK-02 / GK-03 (Non Neutral)
Three Phase Voltage Control Relay
232/page

GK-04 / GK-04F (Non Neutral)
Three Phase Over And Under Voltage Control Relay
234/page

DGK-01 / DGK-01W
Digital Mono Phase Voltage Control Relay
236/page

DGK-01C
Digital Mono Phase Voltage Control Relay
238/page

DGS-04 / DGS-04F
Three Phase Voltage Control Relay (Non Neutral, Din Type)
248/page

GKV-13/13F (Non Neutral)
Three Phase Over And Under Voltage Control Relay
208/page

GKV-15/15F (3x220VAC)(Non Neutral)
Three Phase Over And Under Voltage Control Relay
210/page

GKM-11
Mono Phase Over And Under Voltage Control Relay
212/page

GKM-02/02F (With Neutral)
Three Phase Over And Under Voltage Control Relay
214/page

GK-12 / GK-13 (Non Neutral)
Three Phase Voltage Control Relay
224/page

GK-14 / GK-14F (Non Neutral)
Three Phase Over And Under Voltage Control Relay
226/page

GK-02N/03N (With Neutral)
Three Phase Voltage Control Relay
228/page

GK-04N / 04FN (With Neutral)
Three Phase Over And Under Voltage Control Relay
230/page

DGK-03 (Non Neutral)
Digital Three Phase Voltage Control Relay
240/page

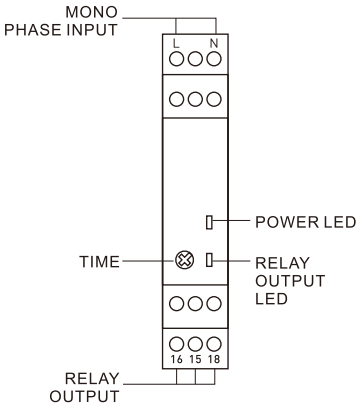
DGK-04 / 04P (Non Neutral)
Three Phase Voltage Control Relay
242/page

DGK-04F / 04PF (Non Neutral)
Three Phase Voltage Control Relay
244/page

DGS-03
Digital Three Phase Voltage Control Relay (Non Neutral) (Pin Type)
246/page

UVR-01

Mono Phase Under Voltage Control Relay



General Description

UVR-01 Under voltage relay is designed for preventing Mono phase devices to get harmed from long-term voltage fluctuations.

Protection

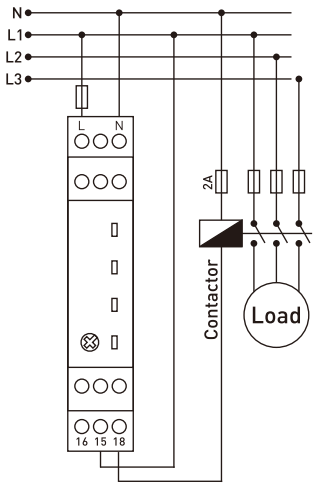
Protective Item	Operating (Trip) Time
Under Voltage	1sec.(Fixed)

Auto Reset

When the fault is eliminated, UVR is automatically reset.

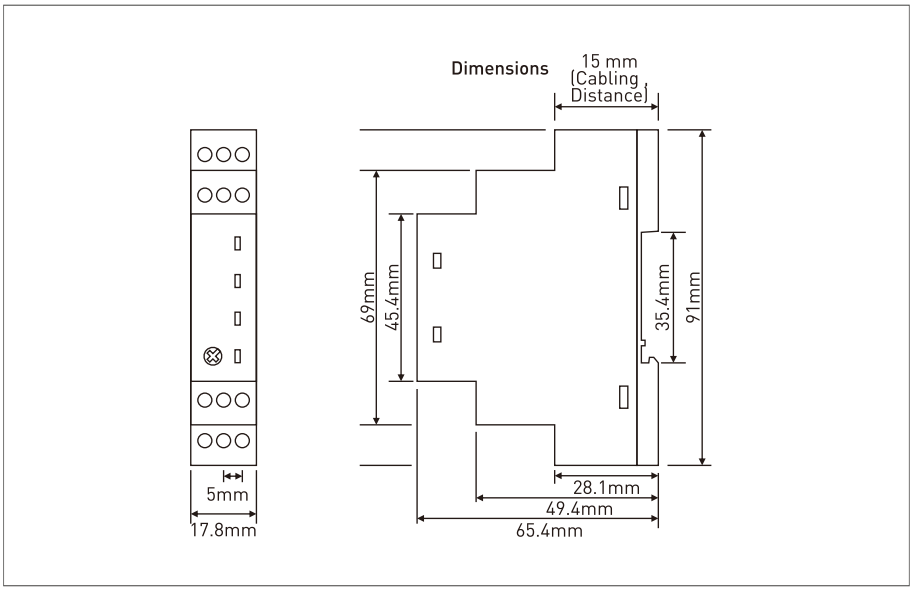
LED Indication

Model	Condition	ON(Red)LED	OUT(Green)LED	Remarks
UVR-01	Normal Running	○	○	◑:Blink ○:ON ×:OFF
	Trip	○	×	
	Reset	○	◑	



Specifications

Type	Model	Function
	UVR-01	U<: 170VAC(Fixed)
Time	Trip delay	1sec.(Fixed)
	Auto reset	1min.~10min.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	220VAC(L-N)
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 15 ⊣⊢ 16 open, 15 ⊣ ⊢ 18 close
		When Trip, 15 ⊣⊢ 16 close, 15 ⊣ ⊢ 18 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<70gr.



Ordering

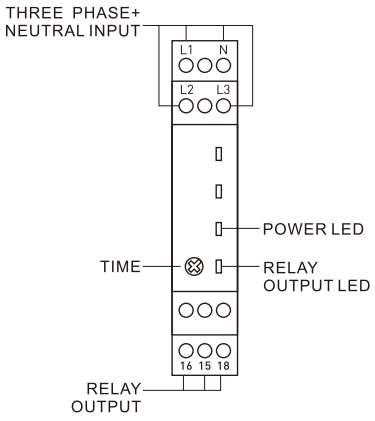
U V R - 0 1

①

①	Type	U<: 170VAC(L-N)

UVR-21

Three Phase Under Voltage Control Relay



General Description

UVR-21 Under voltage relay is designed for preventing three phase devices to get harmed from long-term voltage fluctuations.

Protection

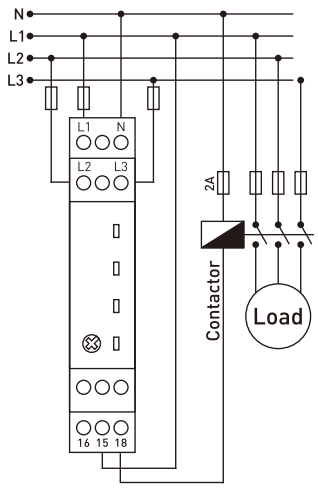
Protective Item	Operating (Trip) Time
Trip Time	1sec.(Fixed)

Auto Reset

When the fault is eliminated, UVR is automatically reset.

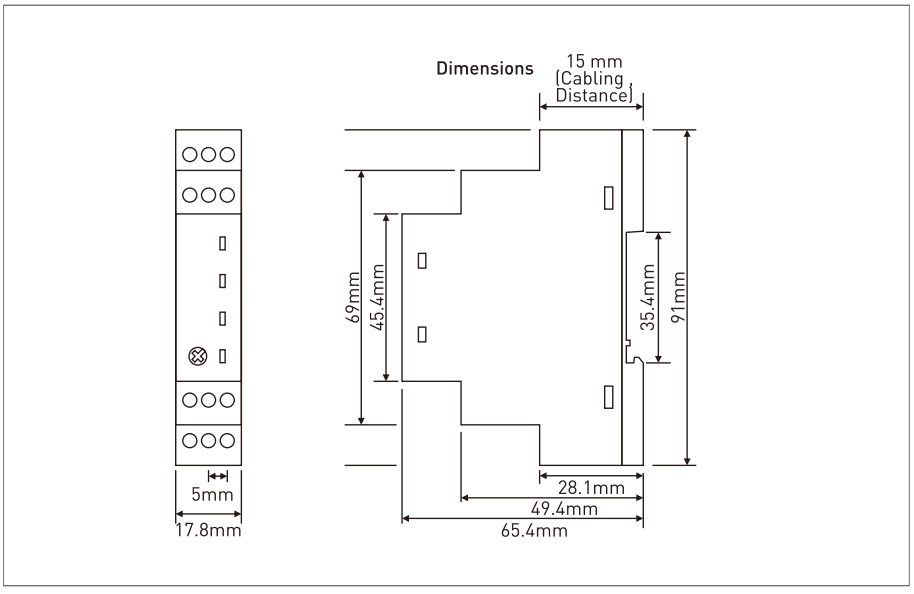
LED Indication

Model	Condition	ON(Red)LED	OUT(Green)LED	Remarks
UVR-21	Normal Running	○	○	◑:Blink ○:ON ×:OFF
	Trip	○	×	
	Reset	○	◑	



Specifications

Type	Model	Function
	UVR-21	U<: 170VAC(Fixed)
Time	Trip delay	1sec.(Fixed)
	Auto reset	1min.~10min.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC+Neutral
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 15 ⊣⊢ 16 open, 15 ⊣ ⊢ 18 close
		When Trip, 15 ⊣⊢ 16 close, 15 ⊣ ⊢ 18 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<75gr.



Ordering

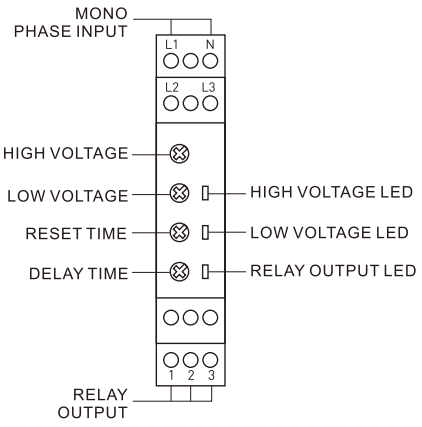
U V R - 2 1

①

①	Type	U<: 170VAC(L-N)

UVR-11

Mono Phase Over And Under Voltage Control Relay



General Description

UVR-11 Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

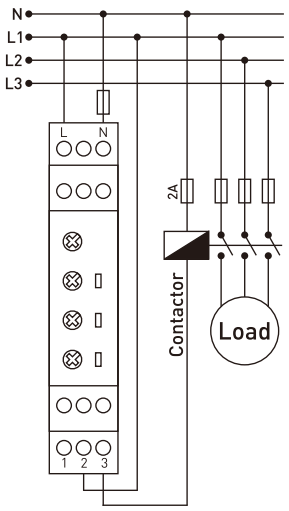
Protective Item	Operating (Trip) Time
High Voltage	Delay Time Knob
Low Voltage	Delay Time Knob

Auto Reset

When the fault is eliminated, UVR is automatically reset.

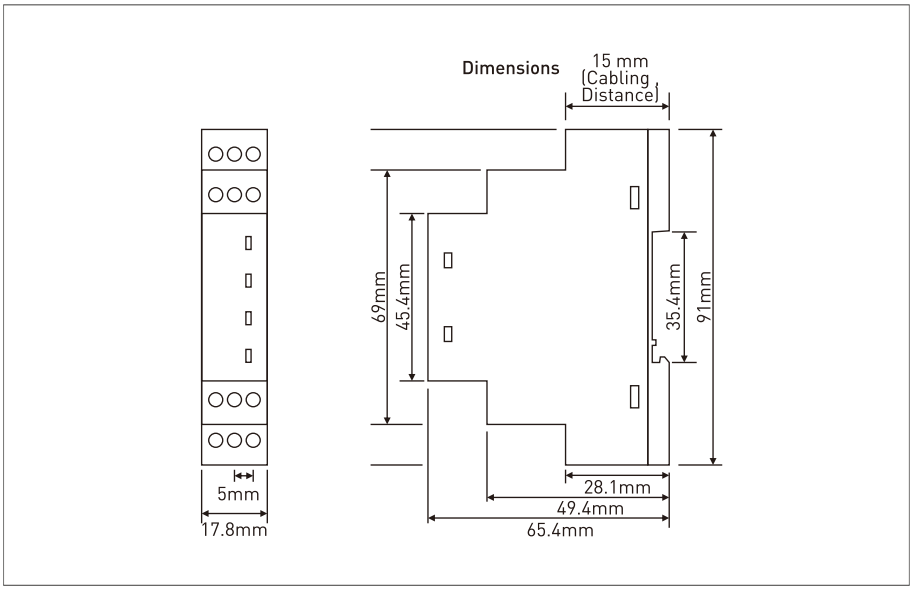
LED Indication

Model	Condition	HV(Red)LED	LV(Red)LED	OUTPUT(GREEN) LED
UVR-11	Normal Running	×	×	○
	High Voltage	○	×	×
	Low Voltage	×	○	×



Specifications

Type	Model	Function
	UVR-11	U>: 230 ~ 300VAC + Off
		U<: 140 ~ 210VAC + Off
Time	Trip delay	0.1 ~ 20 sec.
	Auto reset	0.1 ~ 20 sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	220VAC(L-N)
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊬ 2 open, 2 ⊣ ⊢ 3 close
		When Trip, 1 ⊣⊬ 2 close, 2 ⊣ ⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<70gr.



Ordering

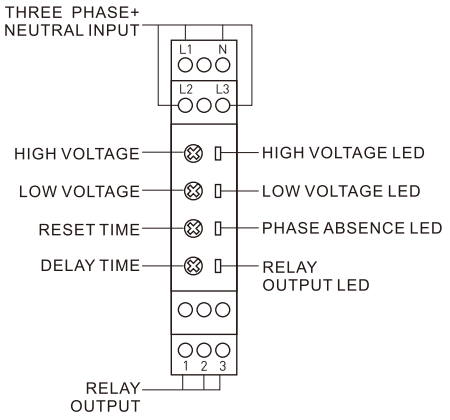
U V R - 1 1

①

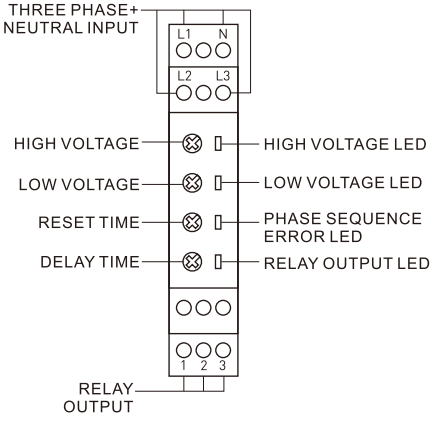
①	Type	U>: 230 ~ 300VAC + Off, U<: 140 ~ 210VAC + Off

GKV-12 / GKV-12F (With Neutral)

Three Phase Over And Under Voltage Control Relay



※ For GKV-12



※ For GKV-12F

General Description

GKV Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time	
Model	GKV-12	GKV-12F
High Voltage	Delay Time Knob	
Low Voltage	Delay Time Knob	
High Voltage Fuse	100 msec.(Fixed)	
Low Voltage Fuse	100 msec.(Fixed)	
Phase Absence	100 msec.(Fixed)	
Phase Sequence	–	Disable Relay Output
Inadequate Supply Voltage	Disable Relay Output	

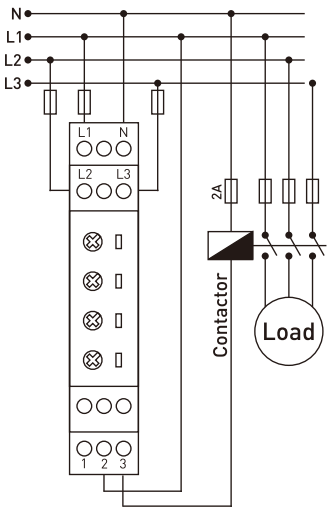
Auto Reset

When the fault is eliminated, GKV is automatically reset.

LED Indication

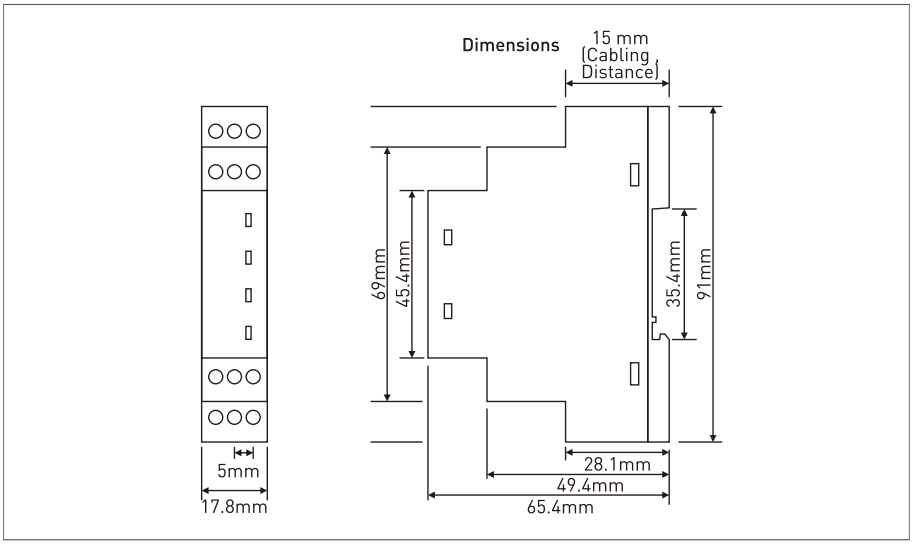
Model	Condition	HV(Red) LED	LV(Red) LED	⅄ (Red) LED	OUTPUT (GREEN) LED	Remarks
GKV-12	Normal Running	×	×	×	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	×	×	
	Low Voltage	×	○	×	×	
	High Voltage Fuse	◑	×	×	×	
	Low Voltage Fuse	×	◑	×	×	
	Phase Absence	×	×	○	×	
	Inadequate supply voltage	◑	◑	×	×	

Model	Condition	HV(Red) LED	LV(Red) LED	X(Red) LED	OUTPUT (GREEN) LED	Remarks
GKV-12F	Normal Running	×	×	×	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	×	×	
	Low Voltage	×	○	×	×	
	High Voltage Fuse	◑	×	×	×	
	Low Voltage Fuse	×	◑	×	×	
	Phase Absence	×	×	○	×	
	Phase Sequence Error	×	×	○	×	
	Inadequate supply voltage	◑	◑	×	×	



Specifications

Type	Model	Function
	GKV-12	U>: 230 ~ 300VAC + Off, U<: 140 ~ 210VAC + Off
	GKV-12F	U>: 230 ~ 300VAC + Off, U<: 140 ~ 210VAC + Off; Phase Sequence
Time	Trip Delay	0.1 ~ 20 sec.
	Auto reset	0.1 ~ 20 sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC+Neutral
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢3 close,
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<80gr.



Ordering

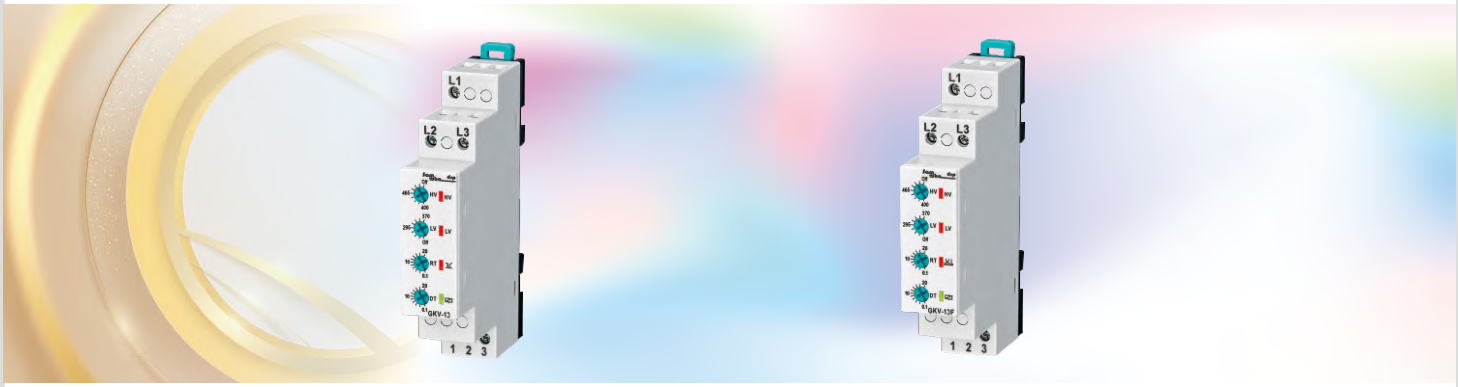
G K V - 1 2 F

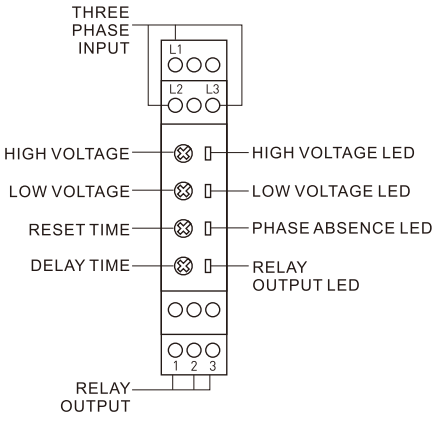
① ②

①	Type		
②	Model	12	U>: 230 ~ 300VAC + Off, U<: 140 ~ 210VAC + Off
		12F	U>: 230 ~ 300VAC + Off, U<: 140 ~ 210VAC + Off; Phase Sequence

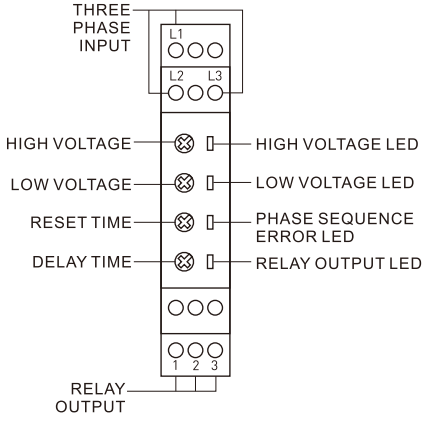
GKV-13 / GKV-13F (Non Neutral)

Three Phase Over And Under Voltage Control Relay





※ For GKV-13



※ For GKV-13F

General Description

GKV Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time	
Model	GKV-13	GKV-13F
High Voltage	Delay Time Knob	
Low Voltage	Delay Time Knob	
High Voltage Fuse	100 msec.(Fixed)	
Low Voltage Fuse	100 msec.(Fixed)	
Phase Absence	100 msec.(Fixed)	
Phase Sequence	–	Disable Relay Output

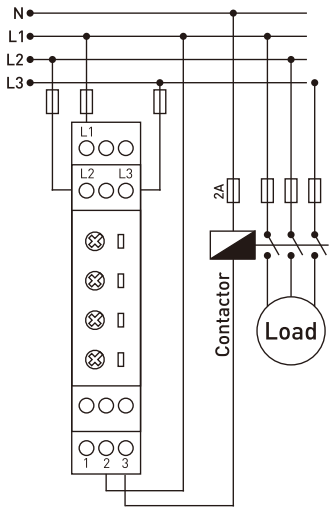
Auto Reset

When the fault is eliminated, GKV is automatically reset.

LED Indication

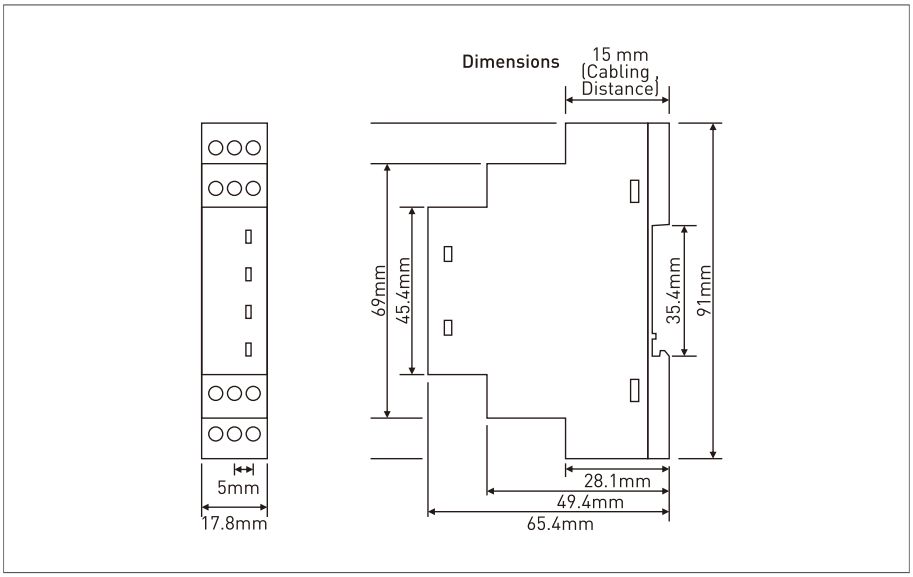
Model	Condition	HV(Red) LED	LV(Red) LED	ON(Red) LED	OUTPUT (GREEN) LED	Remarks
GKV-13	Normal Running	×	×	○	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	○	×	
	Low Voltage	×	○	○	×	
	High Voltage Fuse	◑	×	○	×	
	Low Voltage Fuse	×	◑	○	×	
	Phase Absence	×	○	○	×	

Model	Condition	HV(Red) LED	LV(Red) LED	X(Red) LED	OUTPUT (GREEN) LED	Remarks
GKV-13F	Normal Running	×	×	×	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	×	×	
	Low Voltage	×	○	×	×	
	High Voltage Fuse	◑	×	×	×	
	Low Voltage Fuse	×	◑	×	×	
	Phase Absence	×	×	○	×	
	Phase Sequence Error	×	×	○	×	



Specifications

Type	Model	Function
	GKV-13	U>: 400 ~ 510VAC + Off, U<: 240 ~ 370VAC + Off
	GKV-13F	U>: 400 ~ 510VAC + Off, U<: 240 ~ 370VAC + Off; Phase Sequence
Time	Trip Delay	0.1 ~ 20 sec.
	Auto reset	0.1 ~ 20 sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢3 close
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<80gr.



Ordering

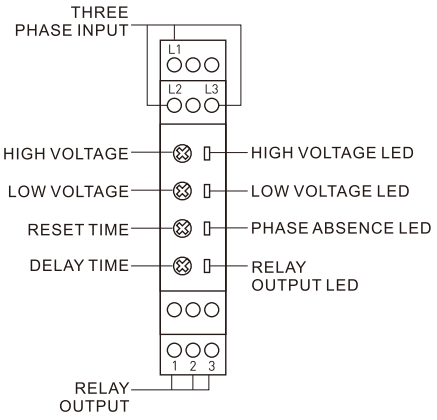
G K V - 1 3 F

① ②

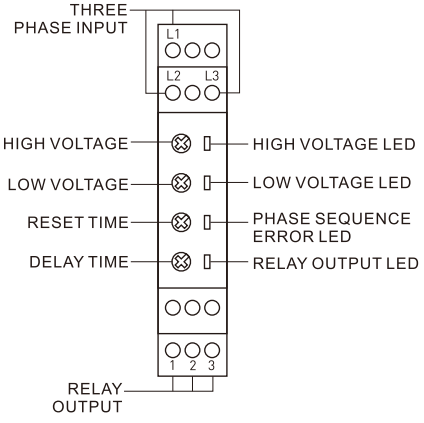
①	Type		
②	Model	13	U>: 400 ~ 510VAC + Off, U<: 240 ~ 370VAC + Off
		13F	U>: 400 ~ 510VAC + Off, U<: 240 ~ 370VAC + Off; Phase Sequence

GKV-15 / GKV-15F (3x220VAC)(Non Neutral)

Three Phase Over And Under Voltage Control Relay



※ For GKV-15



※ For GKV-15F

General Description

GKV Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time	
Model	GKV-15	GKV-15F
High Voltage	Delay Time Knob	
Low Voltage	Delay Time Knob	
High Voltage Fuse	100 msec.(Fixed)	
Low Voltage Fuse	100 msec.(Fixed)	
Phase Absence	100 msec.(Fixed)	
Phase Sequence	–	Disable relay output

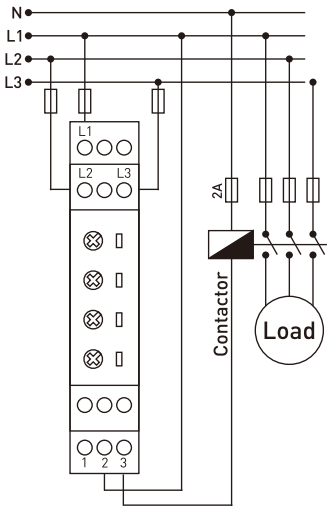
Auto Reset

When the fault is eliminated, GKV is automatically reset.

LED Indication

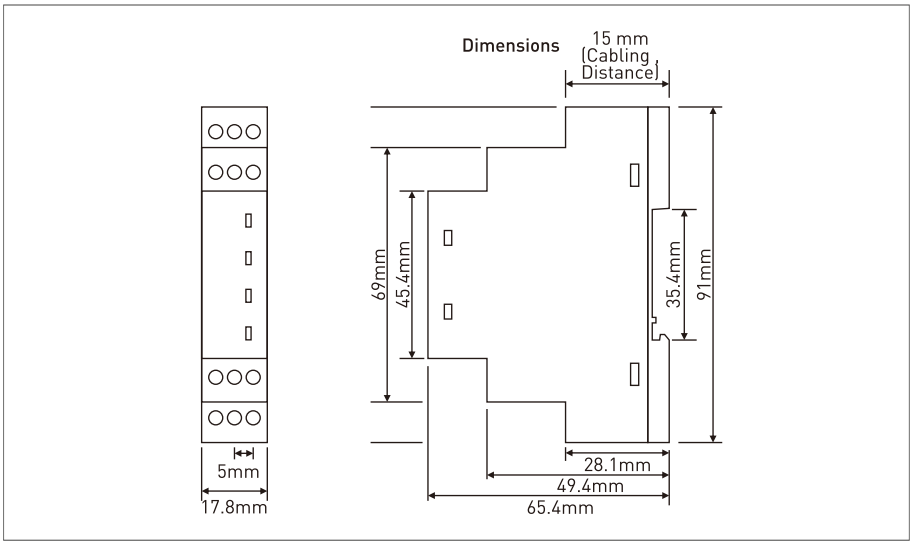
Model	Condition	HV(Red) LED	LV(Red) LED	ON(Red) LED	OUTPUT (GREEN) LED	Remarks
GKV-15	Normal Running	×	×	○	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	○	×	
	Low Voltage	×	○	○	×	
	High Voltage Fuse	◑	×	○	×	
	Low Voltage Fuse	×	◑	○	×	
	Phase Absence	×	○	○	×	

Model	Condition	HV(Red) LED	LV(Red) LED	X(Red) LED	OUTPUT (GREEN) LED	Remarks
GKV-15F	Normal Running	×	×	×	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	×	×	
	Low Voltage	×	○	×	×	
	High Voltage Fuse	◑	×	×	×	
	Low Voltage Fuse	×	◑	×	×	
	Phase Absence	×	×	○	×	
	Phase Sequence Error	×	×	○	×	



Specifications

Type	Model	Function
	GKV-15	U>: 230 ~ 300VAC + Off, U<: 140 ~ 210VAC + Off
	GKV-15F	U>: 230 ~ 300VAC + Off, U<: 140 ~ 210VAC + Off; Phase Sequence
Time	Trip Delay	0.1 ~ 20 sec.
	Auto reset	0.1 ~ 20 sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x220VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢3 close,
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<80gr.



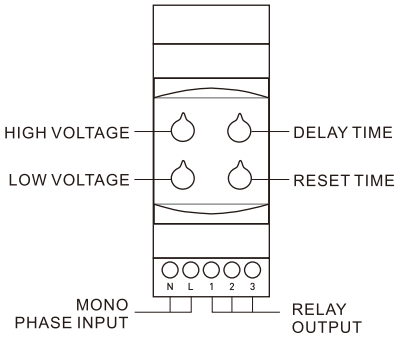
Ordering

G	K	V	-	1	5	F
	①			②		

①	Type		
②	Model	12	U>: 230 ~ 300VAC + Off, U<: 140 ~ 210VAC + Off
		12F	U>: 230 ~ 300VAC + Off, U<: 140 ~ 210VAC + Off; Phase Sequence

GKM-11

Mono Phase Over And Under Voltage Control Relay



General Description

GKM Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

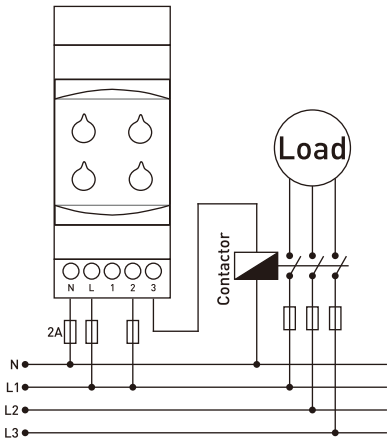
Protective Item	Operating (Trip) Time
High Voltage	Delay Time Knob
Low Voltage	Delay Time Knob

Auto Reset

When the fault is eliminated, GKM is automatically reset.

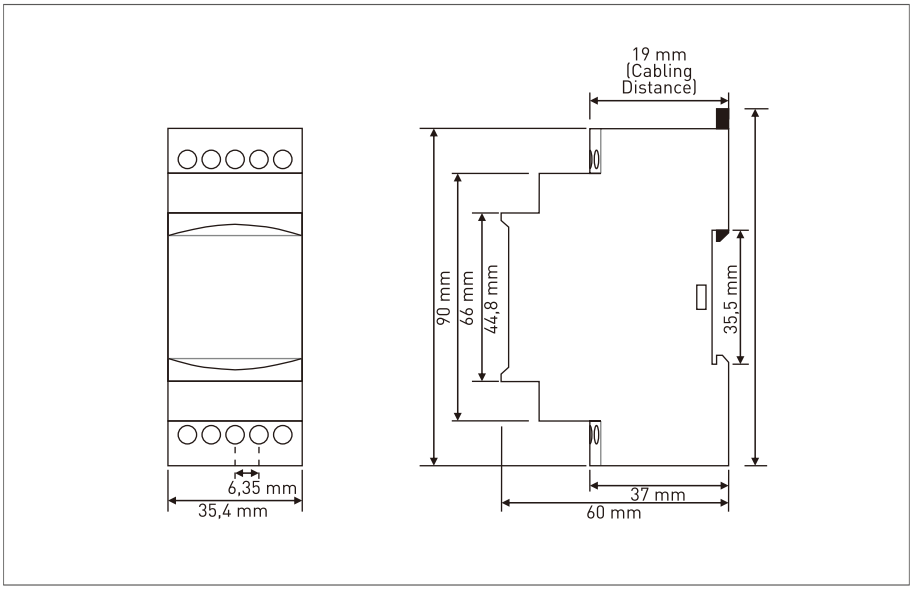
LED Indication

Model	Condition	HV(Red)LED	LV(Red)LED	OUT(Green)LED	Remarks
GKM-11	Normal Running	×	×	○	○:ON ×:OFF
	High Voltage	○	×	×	
	Low Voltage	×	○	×	



Specifications

Type	Model	Function
	GKM-11	U>: 230 ~ 300VAC + Off, U<: 150 ~ 210VAC + Off
Time	Trip Delay	0.1 ~ 20 sec.
	Auto reset	0.1 ~ 20 sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	220VAC(L-N)
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢ 3 close,
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<100gr.



Ordering

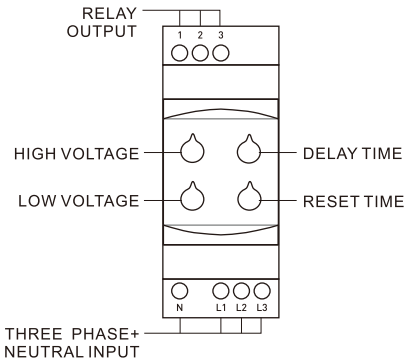
G K M - 1 1

①

①	Type	U>: 230 ~ 300VAC + Off, U<: 150 ~ 210VAC + Off

GKM-02 / GKM-02F (With Neutral)

Three Phase Over And Under Voltage Control Relay



General Description

GKM Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time	
Model	GKM-02	GKM-02F
High Voltage	Delay Time Knob	
Low Voltage	Delay Time Knob	
High Voltage Fuse	100 msec.(Fixed)	
Low Voltage Fuse	100 msec.(Fixed)	
Phase Absence	100 msec.(Fixed)	
Phase Sequence	–	Disable Relay Output
Inadequate Supply Voltage	Disable Relay Output	

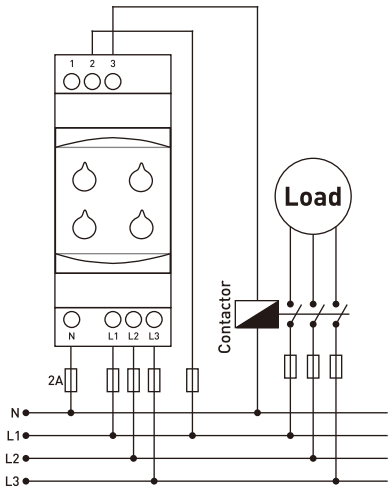
Auto Reset

When the fault is eliminated, GKM is automatically reset.

LED Indication

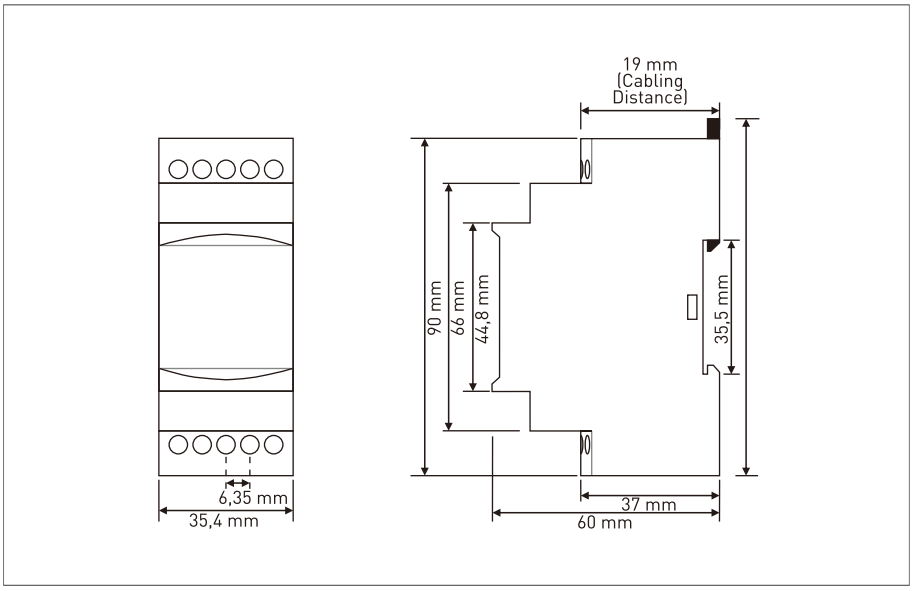
Model	Condition	HV(Red) LED	LV(Red) LED	ON(Red) LED	OUTPUT (GREEN) LED	Remarks
GKM-02	Normal Running	×	×	○	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	○	×	
	Low Voltage	×	○	○	×	
	High Voltage Fuse	◑	×	○	×	
	Low Voltage Fuse	×	◑	○	×	
	Phase Absence	×	○	○	×	
	Inadequate supply voltage	◑	◑	○	×	

Model	Condition	HV(Red) LED	LV(Red) LED	X1(Red) LED	OUTPUT (GREEN) LED	Remarks
GKM-02F	Normal Running	×	×	×	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	×	×	
	Low Voltage	×	○	×	×	
	High Voltage Fuse	◑	×	×	×	
	Low Voltage Fuse	×	◑	×	×	
	Phase Absence	×	×	○	×	
	Phase Sequence Error	×	×	○	×	
	Inadequate supply voltage	◑	◑	×	×	



Specifications

Type	Model	Function
	GKM-02	U<: 140 ~ 210VAC + Off, U>: 230 ~ 300VAC + Off
	GKM-02F	U<: 140 ~ 210VAC + Off, U>: 230 ~ 300VAC + Off; Phase Sequence
Time	Trip delay	0.1 ~ 20 sec.
	Auto reset	0.1 ~ 20 sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC+Neutral
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⫤⫣ 2 open, 2 ⫤⊢ 3 close
		When Trip, 1 ⫤⫣ 2 close, 2 ⫤⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<115gr.



Ordering

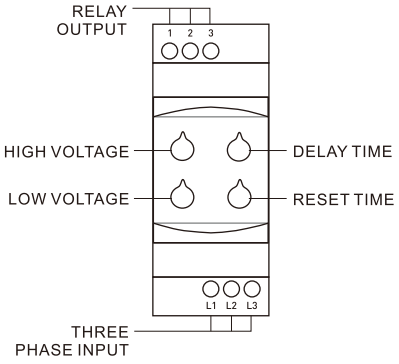
G K M - 0 2 F

① ②

①	Type		
②	Model	02	U>: 230 ~ 300VAC + Off, U<: 140 ~ 210VAC + Off
		02F	U>: 230 ~ 300VAC + Off, U<: 140 ~ 210VAC + Off; Phase Sequence

GKT-03 / GKT-03F (Non Neutral)

Three Phase Over And Under Voltage Control Relay



General Description

GKT Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time	
Model	GKT-03	GKT-03F
High Voltage	Delay Time Knob	
Low Voltage	Delay Time Knob	
High Voltage Fuse	100 msec.(Fixed)	
Low Voltage Fuse	100 msec.(Fixed)	
Phase Absence	100 msec.(Fixed)	
Phase Sequence	–	Disable Relay Output

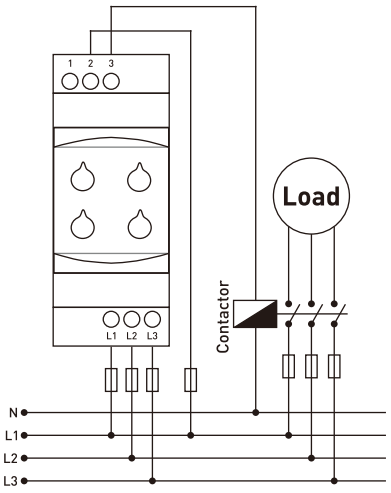
Auto Reset

When the fault is eliminated, GKT is automatically reset.

LED Indication

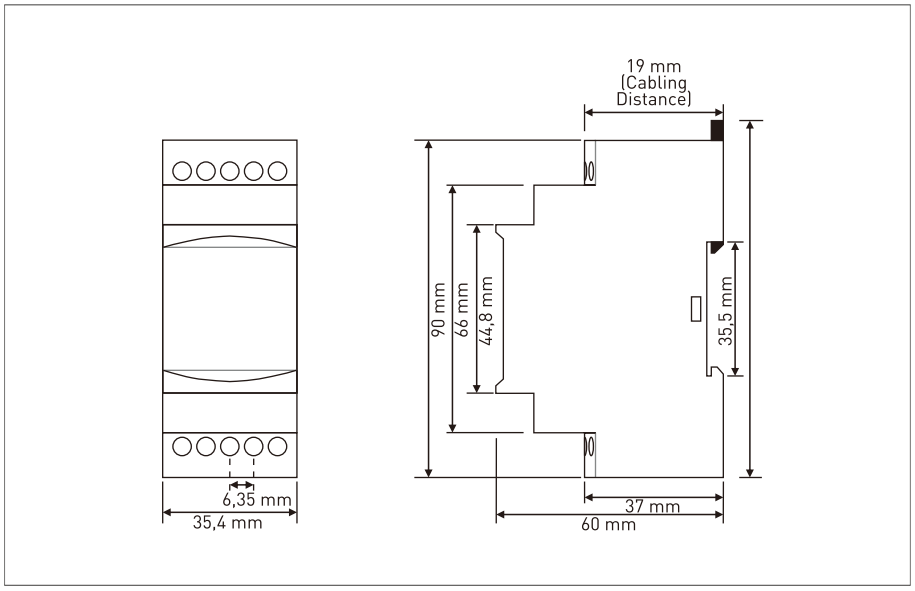
Model	Condition	HV(Red) LED	LV(Red) LED	ON(Red) LED	OUTPUT (GREEN) LED	Remarks
GKT-03	Normal Running	×	×	○	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	○	×	
	Low Voltage	×	○	○	×	
	High Voltage Fuse	◑	×	○	×	
	Low Voltage Fuse	×	◑	○	×	
	Phase Absence	×	○	○	×	

Model	Condition	HV(Red) LED	LV(Red) LED	X1(Red) LED	OUTPUT (GREEN) LED	Remarks
GKT-03F	Normal Running	×	×	×	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	×	×	
	Low Voltage	×	○	×	×	
	High Voltage Fuse	◑	×	×	×	
	Low Voltage Fuse	×	◑	×	×	
	Phase Absence	×	×	○	×	
	Phase Sequence Error	×	×	○	×	



Specifications

Type	Model	Function
	GKT-03	U>: 400 ~ 510VAC + Off, U<: 260 ~ 370VAC + Off
	GKT-03F	U>: 400 ~ 510VAC + Off, U<: 260 ~ 370VAC + Off; Phase Sequence
Time	Trip delay	0.1 ~ 20 sec.
	Auto reset	0.1 ~ 20 sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⫤ 2 open, 2 ⫞ 3 close
		When Trip, 1 ⫤ 2 close, 2 ⫞ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<115gr.



Ordering

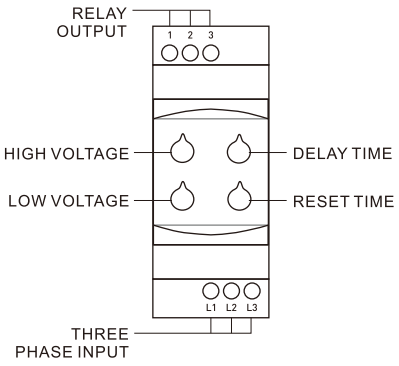
G K T - 0 3 F

① ②

①	Type		
②	Model	03	U>: 400 ~ 510VAC + Off, U<: 260 ~ 370VAC + Off
		03F	U>: 400 ~ 510VAC + Off, U<: 260 ~ 370VAC + Off; Phase Sequence

GKT-05 / GKT-05F (3x220VAC) (Non Neutral)

Three Phase Over And Under Voltage Control Relay



General Description

GKT Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time	
Model	GKT-05	GKT-05F
High Voltage	Delay Time Knob	
Low Voltage	Delay Time Knob	
High Voltage Fuse	100 msec.(Fixed)	
Low Voltage Fuse	100 msec.(Fixed)	
Phase Absence	100 msec.(Fixed)	
Phase Sequence	–	Disable Relay Output

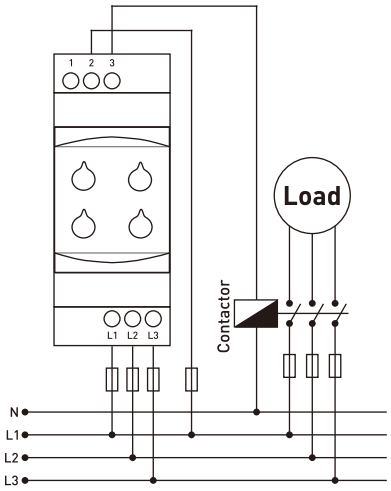
Auto Reset

When the fault is eliminated, GKT is automatically reset.

LED Indication

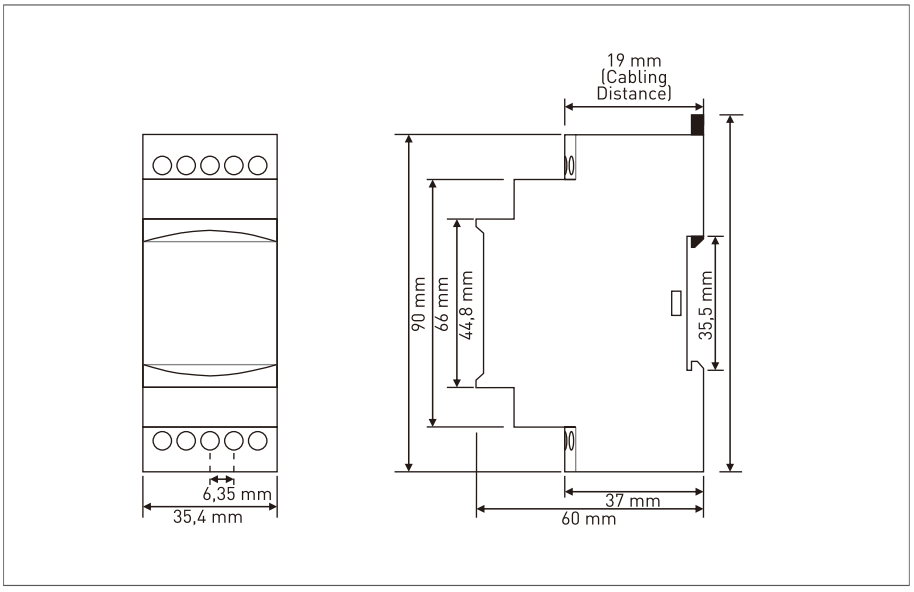
Model	Condition	HV(Red) LED	LV(Red) LED	ON(Red) LED	OUTPUT (GREEN) LED	Remarks
GKT-05	Normal Running	×	×	○	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	○	×	
	Low Voltage	×	○	○	×	
	High Voltage Fuse	◑	×	○	×	
	Low Voltage Fuse	×	◑	○	×	
	Phase Absence	×	○	○	×	

Model	Condition	HV(Red) LED	LV(Red) LED	X1(Red) LED	OUTPUT (GREEN) LED	Remarks
GKT-05F	Normal Running	×	×	×	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	×	×	
	Low Voltage	×	○	×	×	
	High Voltage Fuse	◑	×	×	×	
	Low Voltage Fuse	×	◑	×	×	
	Phase Absence	×	×	○	×	
	Phase Sequence Error	×	×	○	×	



Specifications

Type	Model	Function
	GKT-03	U<: 260 ~ 370VAC + Off, U>: 400 ~ 510VAC + Off
	GKT-03F	U<: 260 ~ 370VAC + Off, U>: 400 ~ 510VAC + Off; Phase Sequence
Time	Trip delay	0.1 ~ 20 sec.
	Auto reset	0.1 ~ 20 sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x220VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢ 3 close
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<115gr.



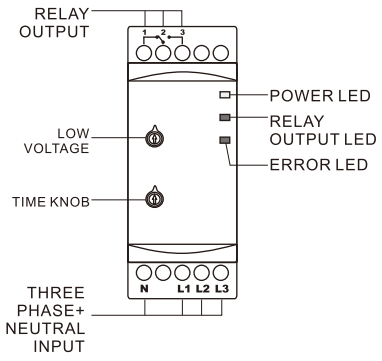
Ordering

G	K	T	-	0	5	F
	①			②		

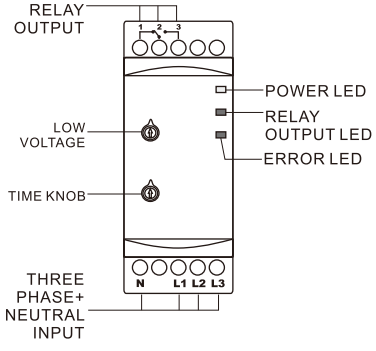
①	Type		
②	Model	05	U<: 140 ~ 210VAC + Off, U>: 230 ~ 300VAC + Off
		05F	U<: 140 ~ 210VAC + Off, U>: 230 ~ 300VAC + Off; Phase Sequence

GK-12N / GK-13N (With Neutral)

Three Phase Voltage Control Relay



※ For GK-12N



※ For GK-13N

General Description

GK Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time	
Model	GK-12N	GK-13N
High Voltage	–	400-460VAC
Low Voltage	260-360VAC	–

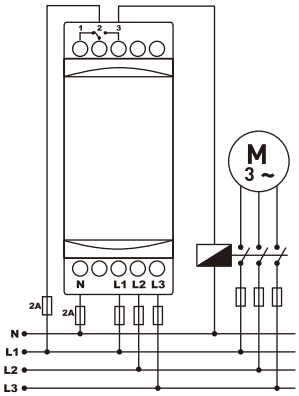
Auto Reset

When the fault is eliminated, GK is automatically reset.

LED Indication

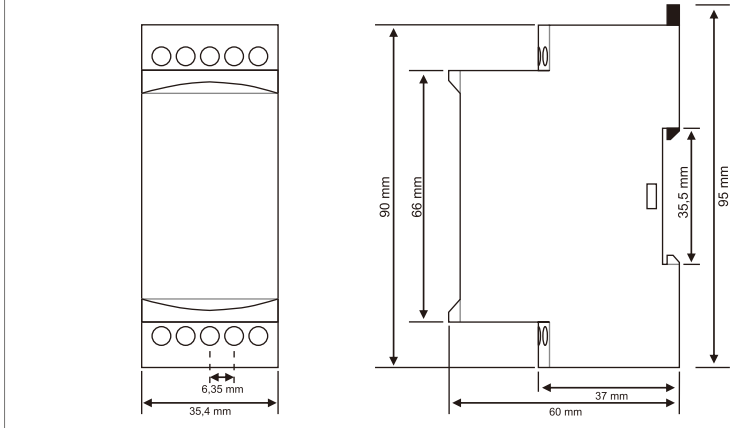
Model	Condition	Pwr(Red)LED	Rly(Green)LED	Err(Red)LED	Remarks
GK-12N	Normal Running	○	○	×	○:ON ×:OFF
	Low Voltage	○	×	○	

Model	Condition	Pwr(Red)LED	Rly(Green)LED	Err(Red)LED	Remarks
GK-13N	Normal Running	○	○	×	○:ON ×:OFF
	High Voltage	○	×	○	



Specifications

Type	Model	Function
	GK-12N	U<: 260 ~ 360VAC
	GK-13N	U>: 400 ~ 460VAC
Time	Auto Reset/Delay Trip	0.1 ~ 10sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC+Neutral
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢3 close
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<210gr.



Ordering

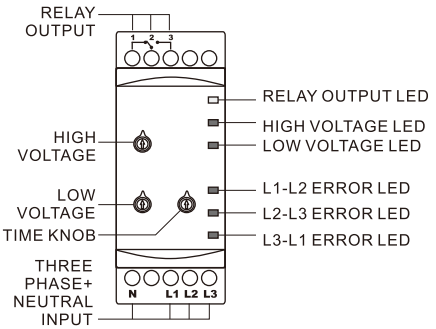
G K - 1 2 N

① ②

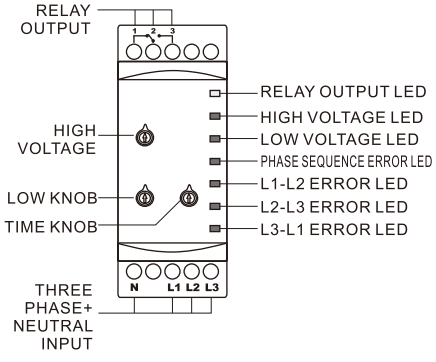
①	Type		
②	Model	12N	U<: 260 ~ 360VAC
		13N	U>: 400 ~ 460VAC

GK-14N / GK-14FN (With Neutral)

Three Phase Over And Under Voltage Control Relay



※ For GK-14N



※ For GK-14FN

General Description

GK Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time	
Model	GK-14N	GK-14FN
High Voltage	400-460VAC	400-460VAC
Low Voltage	260-360VAC	260-360VAC
Phase Sequence	–	Disable Relay Output

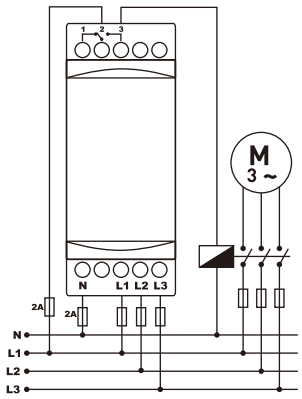
Auto Reset

When the fault is eliminated, GK is automatically reset.

LED Indication

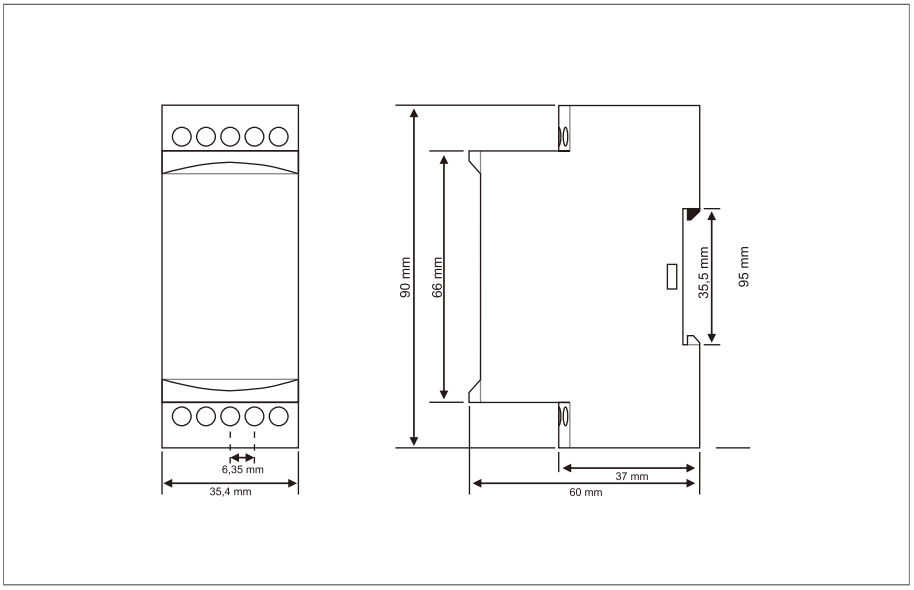
Model	Condition	Rly(Green) LED	U>(Red) LED	U<(Red) LED	L12 (Green) LED	L23 (Green) LED	L31 (Green) LED	Remarks
GK-14N	Normal Running	○	×	×	○	○	○	○:ON ×:OFF
	L1-L2 High Voltage	×	○	×	×	○	○	
	L2-L3 High Voltage	×	○	×	○	×	○	
	L3-L1 High Voltage	×	○	×	○	○	×	
	L1-L2-L3 High Voltage	×	○	×	×	×	×	
	L1-L2 Low Voltage	×	×	○	×	○	○	
	L2-L3 Low Voltage	×	×	○	○	×	○	
	L3-L1 Low Voltage	×	×	○	○	○	×	
	L1-L2-L3 Low Voltage	×	×	○	×	×	×	

Model	Condition	Rly (Green) LED	U> (Red) LED	U< (Red) LED	X1 (Red) LED	L12 (Green) LED	L23 (Green) LED	L31 (Green) LED	Remarks
GK-14FN	Normal Running	○	×	×	×	○	○	○	○:ON ×:OFF
	L1-L2 High Voltage	×	○	×	×	×	○	○	
	L2-L3 High Voltage	×	○	×	×	○	×	○	
	L3-L1 High Voltage	×	○	×	×	○	○	×	
	L1-L2-L3 High Voltage	×	○	×	×	×	×	×	
	L1-L2 Low Voltage	×	×	○	×	×	○	○	
	L2-L3 Low Voltage	×	×	○	×	○	×	○	
	L3-L1 Low Voltage	×	×	○	×	○	○	×	
	L1-L2-L3 Low Voltage	×	×	○	×	×	×	×	
	Phase Sequence Error	×	×	×	○	×	×	×	



Specifications

Type	Model	Function
	GK-14N	U<: 260 ~ 360VAC, U>: 400 ~ 460VAC
	GK-14FN	U<: 260 ~ 360VAC, U>: 400 ~ 460VAC; Phase Sequence
Time	Auto Reset/Delay Trip	0.1 ~ 10sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC+Neutral
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢ 3 close
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<210gr.



Ordering

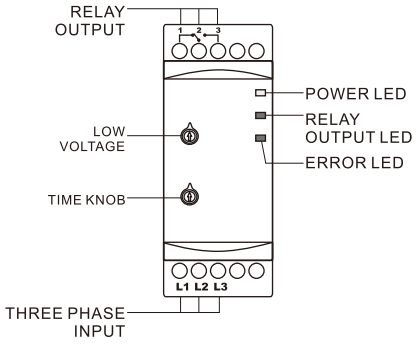
G K - 1 4 N

① ②

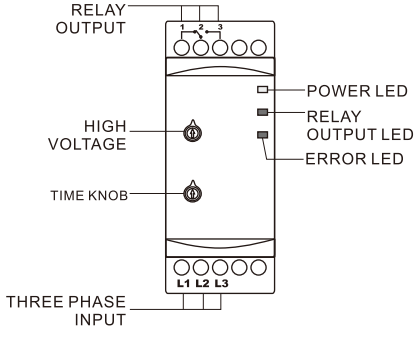
①	Type		
②	Model	14N	U<: 260 ~ 360VAC, U>: 400 ~ 460VAC
		14FN	U<: 260 ~ 360VAC, U>: 400 ~ 460VAC; Phase Sequence

GK-12 / GK-13 (Non Neutral)

Three Phase Voltage Control Relay



※ For GK-12



※ For GK-13

General Description

GK Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time	
Model	GK-12	GK-13
High Voltage	–	400-460VAC
Low Voltage	260-360VAC	–

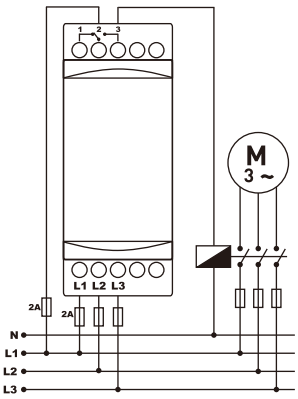
Auto Reset

When the fault is eliminated, GK is automatically reset.

LED Indication

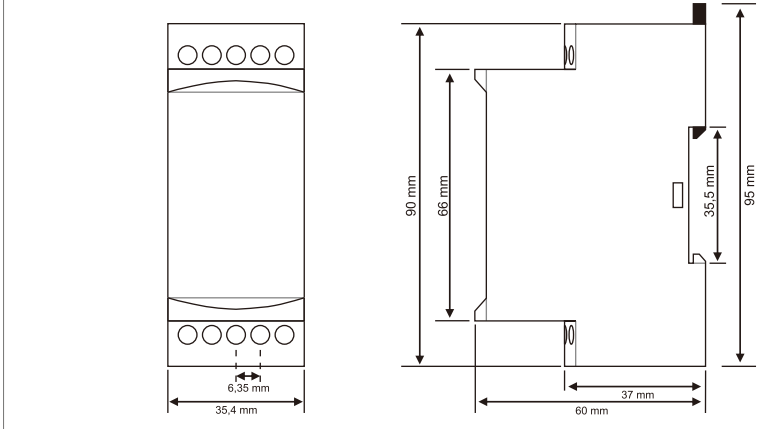
Model	Condition	Pwr(Red)LED	Rly(Green)LED	Err(Red)LED	Remarks
GK-12	Normal Running	○	○	×	○:ON ×:OFF
	Low Voltage	○	×	○	

Model	Condition	Pwr(Red)LED	Rly(Green)LED	Err(Red)LED	Remarks
GK-13	Normal Running	○	○	×	○:ON ×:OFF
	High Voltage	○	×	○	



Specifications

Type	Model	Function
	GK-12	U<: 260 ~ 360VAC
	GK-13	U>: 400 ~ 460VAC
Time	Auto Reset/Delay Trip	0.1 ~ 10sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢3 close
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<210gr.



Ordering

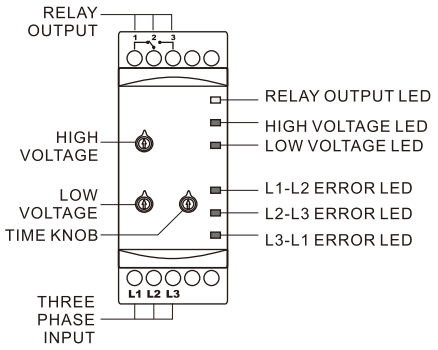
G K - 1 2

① ②

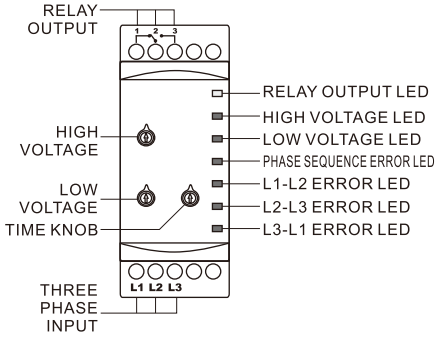
①	Type		
②	Model	12	U<: 260 ~ 360VAC
		13	U>: 400 ~ 460VAC

GK-14 / GK-14F (Non Neutral)

Three Phase Over And Under Voltage Control Relay



※ For GK-14



※ For GK-14F

General Description

GK Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time	
Model	GK-14	GK-14F
High Voltage	400-460VAC	400-460VAC
Low Voltage	260-360VAC	260-360VAC
Phase Sequence	–	Disable Relay Output

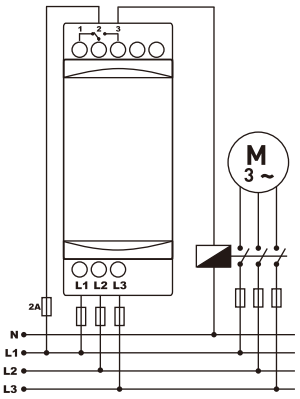
Auto Reset

When the fault is eliminated, GK is automatically reset.

LED Indication

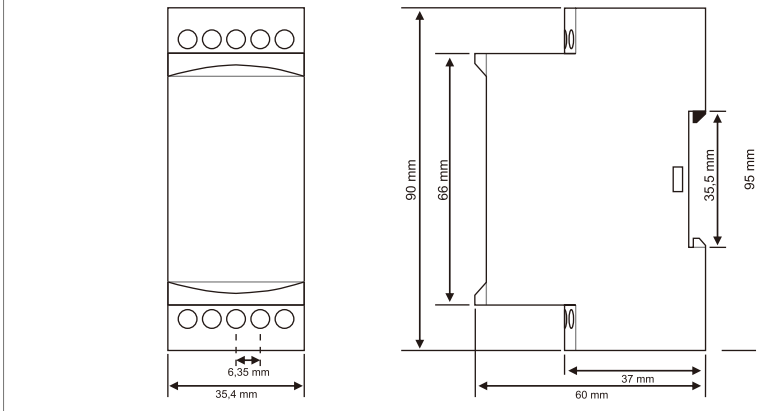
Model	Condition	Rly(Green) LED	U>(Red) LED	U<(Red) LED	L12 (Green) LED	L23 (Green) LED	L31 (Green) LED	Remarks
GK-14	Normal Running	○	×	×	○	○	○	○:ON ×:OFF
	L1-L2 High Voltage	×	○	×	×	○	○	
	L2-L3 High Voltage	×	○	×	○	×	○	
	L3-L1 High Voltage	×	○	×	○	○	×	
	L1-L2-L3 High Voltage	×	○	×	×	×	×	
	L1-L2 Low Voltage	×	×	○	×	○	○	
	L2-L3 Low Voltage	×	×	○	○	×	○	
	L3-L1 Low Voltage	×	×	○	○	○	×	
	L1-L2-L3 Low Voltage	×	×	○	×	×	×	

Model	Condition	Rly (Green) LED	U> (Red) LED	U< (Red) LED	X1 (Red) LED	L12 (Green) LED	L23 (Green) LED	L31 (Green) LED	Remarks
GK-14F	Normal Running	○	×	×	×	○	○	○	○:ON ×:OFF
	L1-L2 High Voltage	×	○	×	×	×	○	○	
	L2-L3 High Voltage	×	○	×	×	○	×	○	
	L3-L1 High Voltage	×	○	×	×	○	○	×	
	L1-L2-L3 High Voltage	×	○	×	×	×	×	×	
	L1-L2 Low Voltage	×	×	○	×	×	○	○	
	L2-L3 Low Voltage	×	×	○	×	○	×	○	
	L3-L1 Low Voltage	×	×	○	×	○	○	×	
	L1-L2-L3 Low Voltage	×	×	○	×	×	×	×	
	Phase Sequence Error	×	×	×	○	×	×	×	



Specifications

Type	Model	Function
	GK-14	U<: 260 ~ 360VAC, U>: 400 ~ 460VAC
	GK-14F	U<: 260 ~ 360VAC, U>: 400 ~ 460VAC; Phase Sequence
Time	Auto Reset/Delay Trip	0.1 ~ 10sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢3 close
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<210gr.



Ordering

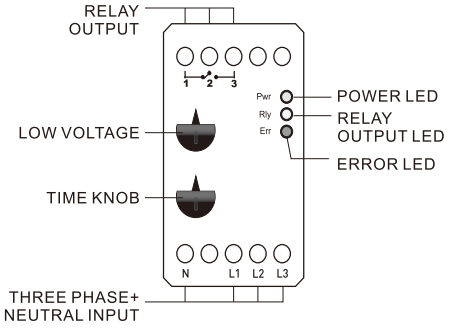
G K - 1 4

① ②

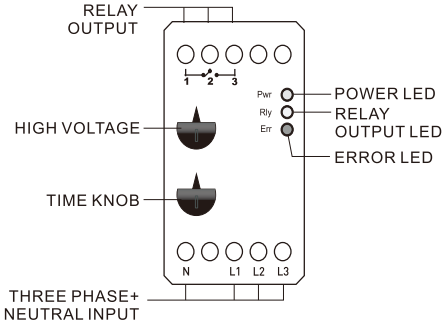
①	Type		
②	Model	14	U<: 260 ~ 360VAC, U>: 400 ~ 460VAC
		14F	U<: 260 ~ 360VAC, U>: 400 ~ 460VAC; Phase Sequence

GK-02N / GK-03N (With Neutral)

Three Phase Voltage Control Relay



※ For GK-02N



※ For GK-03N

General Description

GK Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time	
Model	GK-02N	GK-03N
High Voltage	–	400 ~ 460VAC
Low Voltage	260 ~ 360VAC	–

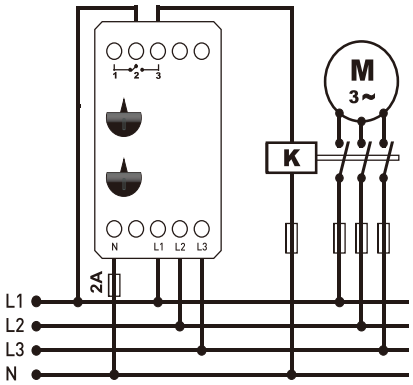
Auto Reset

When the fault is eliminated, GK is automatically reset.

LED Indication

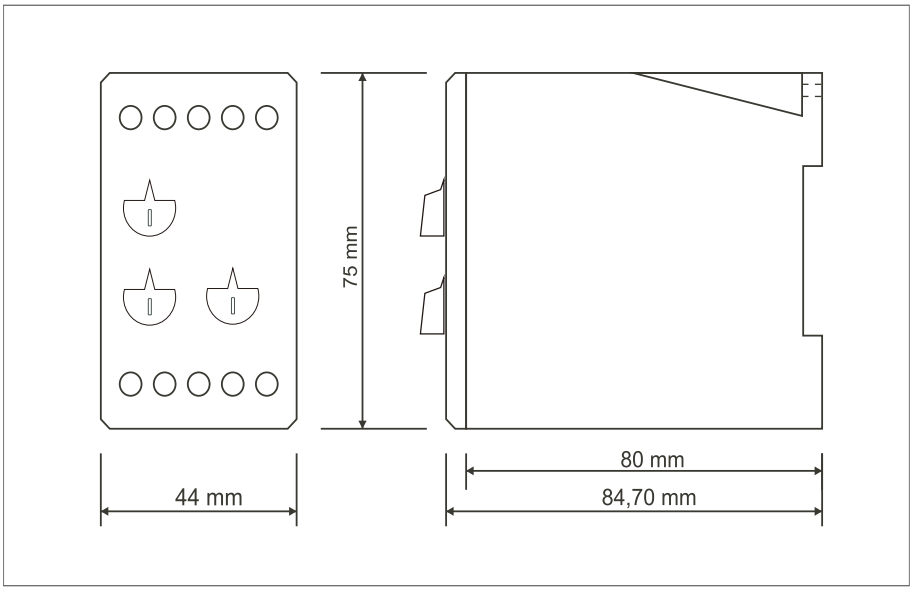
Model	Condition	Pwr(Red)LED	Rly(Green)LED	Err(Red)LED	Remarks
GK-02N	Normal Running	○	○	×	○:ON ×:OFF
	Low Voltage	○	×	○	

Model	Condition	Pwr(Red)LED	Rly(Green)LED	Err(Red)LED	Remarks
GK-03N	Normal Running	○	○	×	○:ON ×:OFF
	High Voltage	○	×	○	



Specifications

Type	Model	Function
	GK-02N	U<: 260 ~ 360VAC
	GK-03N	U>: 400 ~ 460VAC
Time	Auto Reset/Delay Trip	0.1 ~ 10sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC+Neutral
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢3 close
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		<230gr.



Ordering

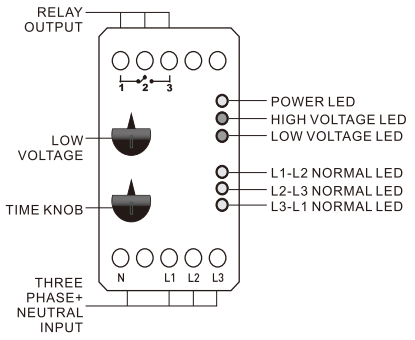
G K - 0 2 N

① ②

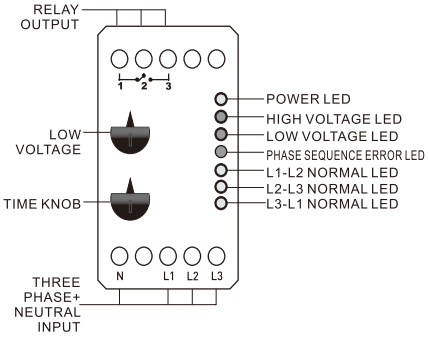
①	Type		
②	Model	02N	U<: 260 ~ 360VAC
		03N	U>: 400 ~ 460VAC

GK-04N / GK-04FN (With Neutral)

Three Phase Over And Under Voltage Control Relay



※ For GK-04N



※ For GK-04FN

General Description

GK Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time	
Model	GK-04N	GK-04FN
High Voltage	400 ~ 460VAC	400 ~ 460VAC
Low Voltage	260 ~ 360VAC	260 ~ 360VAC
Phase Sequence	–	Disable Relay Output

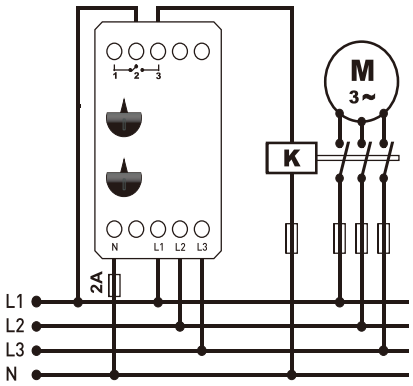
Auto Reset

When the fault is eliminated, GK is automatically reset.

LED Indication

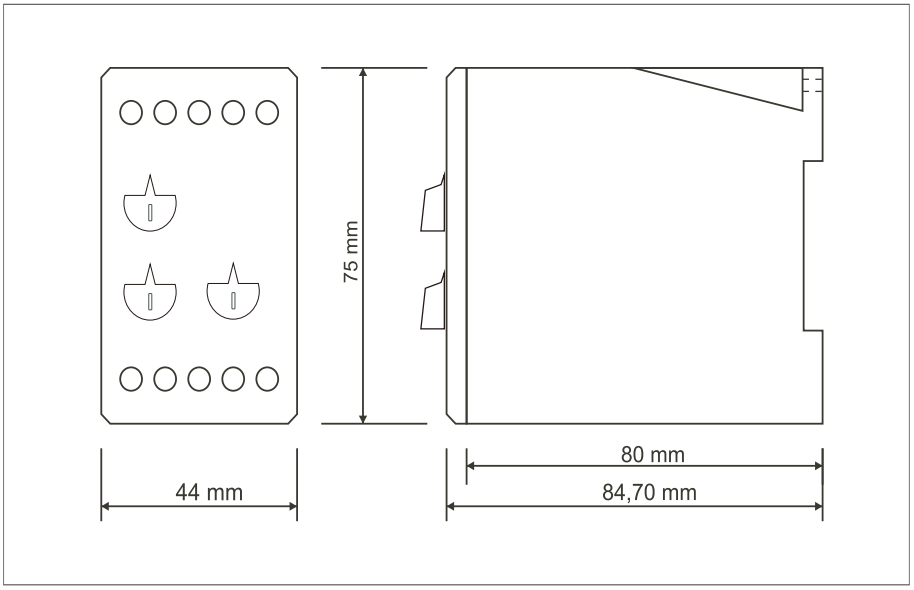
Model	Condition	Rly(Green) LED	U>(Red) LED	U<(Red) LED	L12 (Green) LED	L23 (Green) LED	L31 (Green) LED	Remarks
GK-04N	Normal Running	○	×	×	○	○	○	○:ON ×:OFF
	L1-L2 High Voltage	×	○	×	×	○	○	
	L2-L3 High Voltage	×	○	×	○	×	○	
	L3-L1 High Voltage	×	○	×	○	○	×	
	L1-L2-L3 High Voltage	×	○	×	×	×	×	
	L1-L2 Low Voltage	×	×	○	×	○	○	
	L2-L3 Low Voltage	×	×	○	○	×	○	
	L3-L1 Low Voltage	×	×	○	○	○	×	
	L1-L2-L3 Low Voltage	×	×	○	×	×	×	

Model	Condition	Rly (Green) LED	U> (Red) LED	U< (Red) LED	X1 (Red) LED	L12 (Green) LED	L23 (Green) LED	L31 (Green) LED	Remarks
GK-04FN	Normal Running	○	×	×	×	○	○	○	○:ON ×:OFF
	L1-L2 High Voltage	×	○	×	×	×	○	○	
	L2-L3 High Voltage	×	○	×	×	○	×	○	
	L3-L1 High Voltage	×	○	×	×	○	○	×	
	L1-L2-L3 High Voltage	×	○	×	×	×	×	×	
	L1-L2 Low Voltage	×	×	○	×	×	○	○	
	L2-L3 Low Voltage	×	×	○	×	○	×	○	
	L3-L1 Low Voltage	×	×	○	×	○	○	×	
	L1-L2-L3 Low Voltage	×	×	○	×	×	×	×	
	Phase Sequence Error	×	×	×	○	×	×	×	



Specifications

Type	Model	Function
	GK-04N	U<: 260 ~ 360VAC, U>: 400 ~ 460VAC
	GK-04FN	U<: 260 ~ 360VAC, U>: 400 ~ 460VAC; Phase Sequence
Time	Auto Reset/Delay Trip	0.1 ~ 10sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC+Neutral
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢ 3 close
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		<230gr.



Ordering

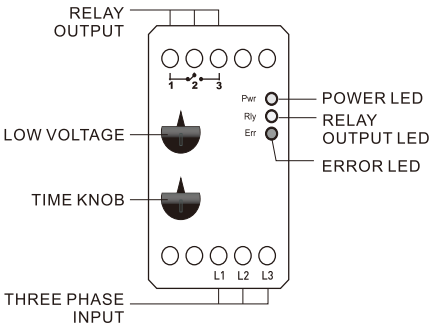
G K - 0 4 N

① ②

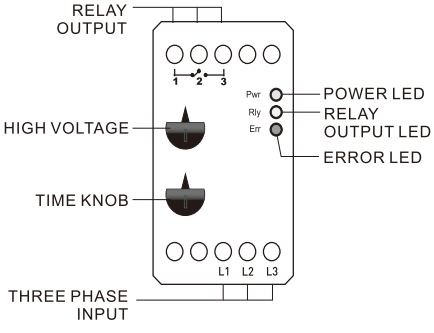
①	Type		
②	Model	04N	U<: 260 ~ 360VAC, U>: 400 ~ 460VAC
		04FN	U<: 260 ~ 360VAC, U>: 400 ~ 460VAC; Phase Sequence

GK-02 / GK-03 (Non Neutral)

Three Phase Voltage Control Relay



※ For GK-02



※ For GK-03

General Description

GK Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time	
Model	GK-02	GK-03
High Voltage	–	400 ~ 460VAC
Low Voltage	260 ~ 360VAC	–

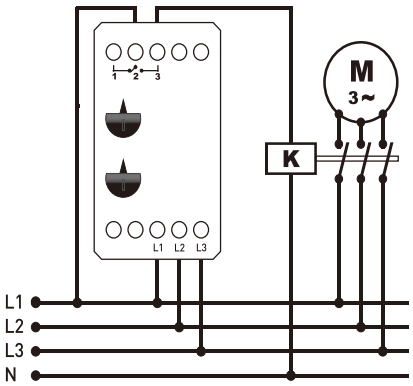
Auto Reset

When the fault is eliminated, GK is automatically reset.

LED Indication

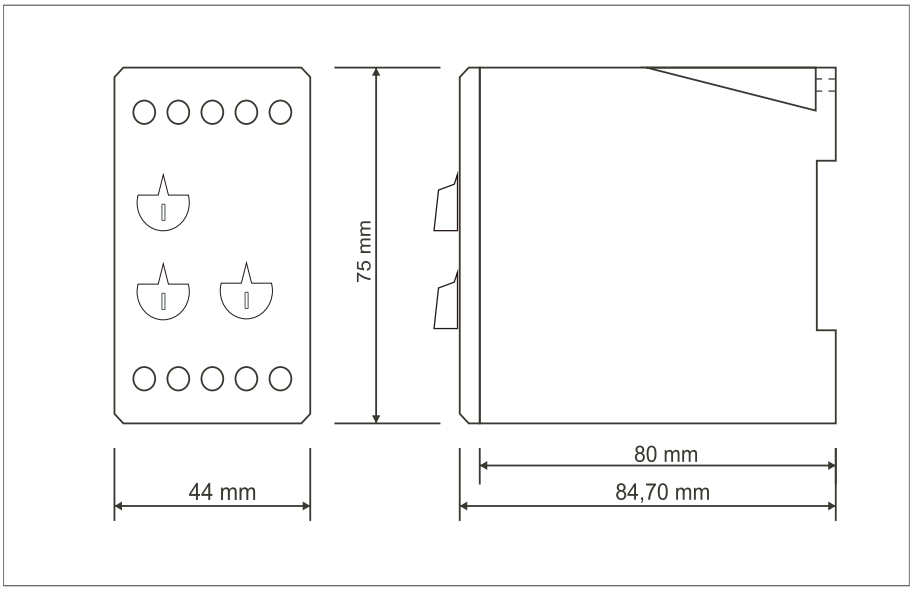
Model	Condition	Pwr(Red)LED	Rly(Green)LED	Err(Red)LED	Remarks
GK-02	Normal Running	○	○	×	○:ON ×:OFF
	Low Voltage	○	×	○	

Model	Condition	Pwr(Red)LED	Rly(Green)LED	Err(Red)LED	Remarks
GK-03	Normal Running	○	○	×	○:ON ×:OFF
	High Voltage	○	×	○	



Specifications

Type	Model	Function
	GK-02	U<: 260 ~ 360VAC
	GK-03	U>: 400 ~ 460VAC
Time	Auto Reset/Delay Trip	0.1 ~ 10sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊬ 2 open, 2 ⊣ ⊢3 close
		When Trip, 1 ⊣⊬ 2 close, 2 ⊣ ⊢3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		<230gr.



Ordering

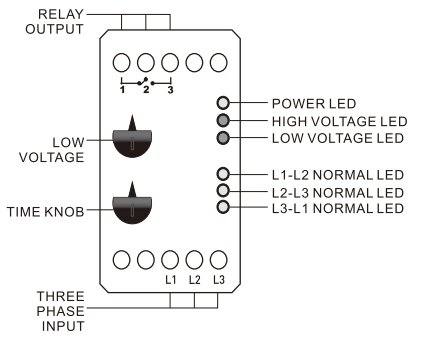
G K - 0 2

① ②

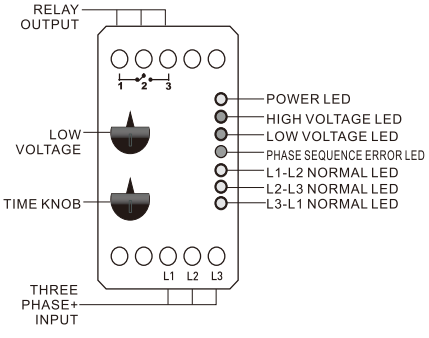
①	Type		
②	Model	02	U<: 260 ~ 360VAC
		03	U>: 400 ~ 460VAC

GK-04 / GK-04F (Non Neutral)

Three Phase Over And Under Voltage Control Relay



※ For GK-04



※ For GK-04F

General Description

GK Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time	
Model	GK-04	GK-04F
High Voltage	400 ~ 460VAC	400 ~ 460VAC
Low Voltage	260 ~ 360VAC	260 ~ 360VAC
Phase Sequence	–	Disable Relay Output

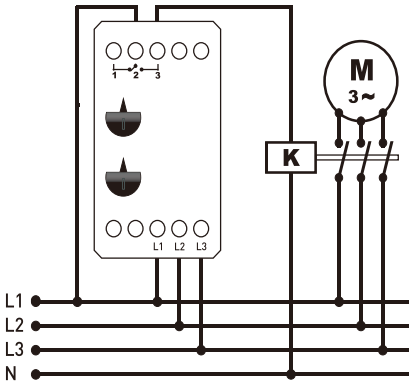
Auto Reset

When the fault is eliminated, GK is automatically reset.

LED Indication

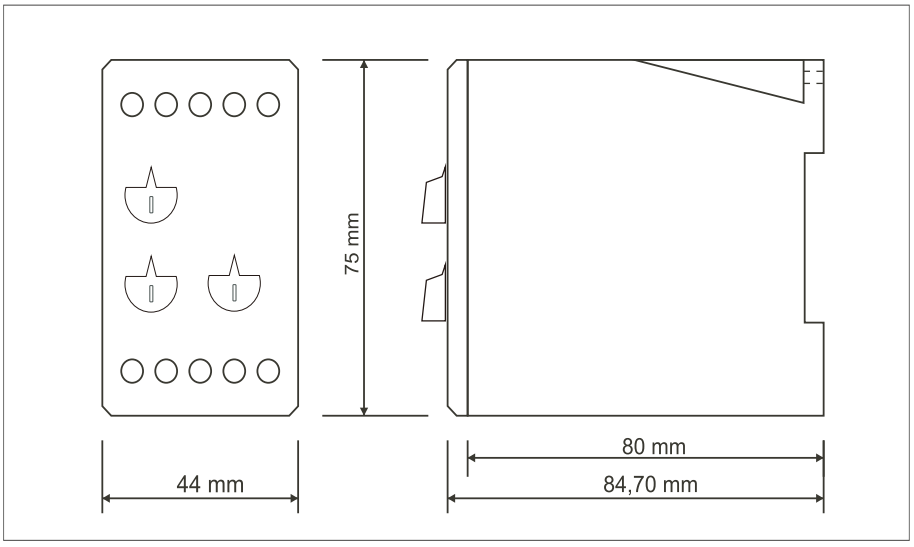
Model	Condition	Rly(Green) LED	U>(Red) LED	U<(Red) LED	L12 (Green) LED	L23 (Green) LED	L31 (Green) LED	Remarks
GK-04	Normal Running	○	×	×	○	○	○	○:ON ×:OFF
	L1-L2 High Voltage	×	○	×	×	○	○	
	L2-L3 High Voltage	×	○	×	○	×	○	
	L3-L1 High Voltage	×	○	×	○	○	×	
	L1-L2-L3 High Voltage	×	○	×	×	×	×	
	L1-L2 Low Voltage	×	×	○	×	○	○	
	L2-L3 Low Voltage	×	×	○	○	×	○	
	L3-L1 Low Voltage	×	×	○	○	○	×	
	L1-L2-L3 Low Voltage	×	×	○	×	×	×	

Model	Condition	Rly (Green) LED	U> (Red) LED	U< (Red) LED	X1 (Red) LED	L12 (Green) LED	L23 (Green) LED	L31 (Green) LED	Remarks
GK-04F	Normal Running	○	×	×	×	○	○	○	○:ON ×:OFF
	L1-L2 High Voltage	×	○	×	×	×	○	○	
	L2-L3 High Voltage	×	○	×	×	○	×	○	
	L3-L1 High Voltage	×	○	×	×	○	○	×	
	L1-L2-L3 High Voltage	×	○	×	×	×	×	×	
	L1-L2 Low Voltage	×	×	○	×	×	○	○	
	L2-L3 Low Voltage	×	×	○	×	○	×	○	
	L3-L1 Low Voltage	×	×	○	×	×	○	×	
	L1-L2-L3 Low Voltage	×	×	○	×	×	×	×	
	Phase Sequence Error	×	×	×	○	×	×	×	



Specifications

Type	Model	Function
	GK-04	U<: 260 ~ 360VAC, U>: 400 ~ 460VAC
	GK-04F	U<: 260 ~ 360VAC, U>: 400 ~ 460VAC; Phase Sequence
Time	Auto Reset/Delay Trip	0.1 ~ 10sec.
Reset		Auto Reset
Indicator		LED
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢ 3 close
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		<230gr.



Ordering

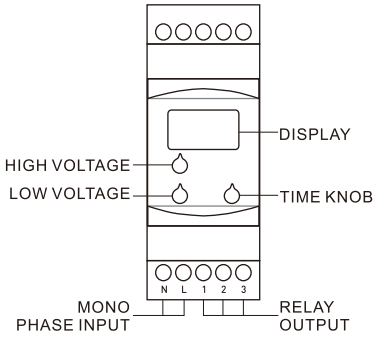
G K - 0 4

① ②

①	Type		
②	Model	04	U<: 260 ~ 360VAC, U>: 400 ~ 460VAC
		04F	U<: 260 ~ 360VAC, U>: 400 ~ 460VAC; Phase Sequence

DGK-01 / DGK-01W

Digital Mono Phase Voltage Control Relay



General Description

DGK Digital voltage relay is designed for preventing Mono phase devices to get harmed from long-term voltage fluctuations.

Protection

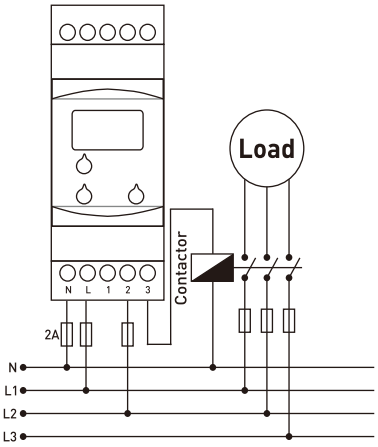
Protective Item	Operating (Trip) Time
High Voltage	Delay Time Knob
Low Voltage	Delay Time Knob

Auto Reset

When the fault is eliminated, DGK is automatically reset.

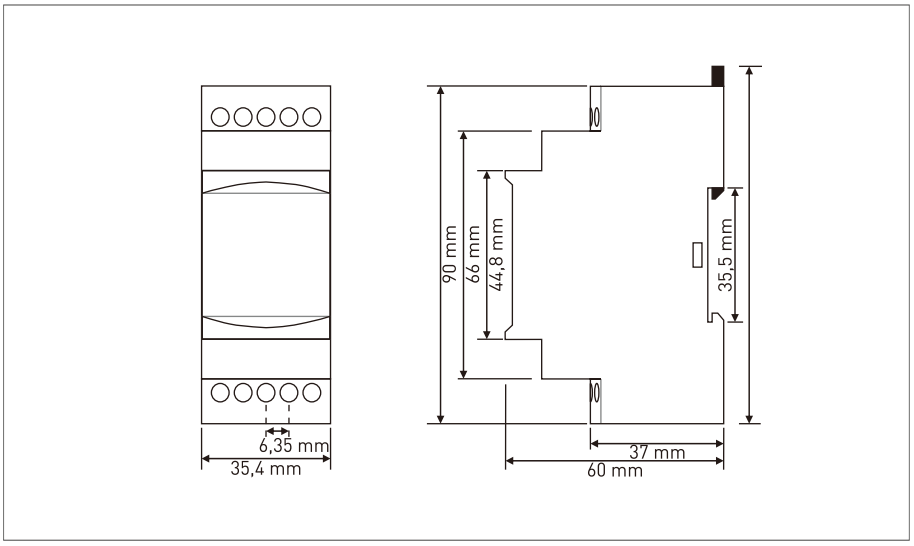
LED Indication

Model	Condition	U>(Red)LED	U<(Red)LED	OUT(GREEN) LED
DGK-01/01W	Normal Running	×	×	○
	High Voltage	○	×	×
	Low Voltage	×	○	×



Specifications

Type	Model	Function
	DGK-01	U>: 230 ~ 280VAC, U<: 150 ~ 210VAC
	DGK-01W	U>: 230 ~ 280VAC, U<: 110 ~ 210VAC
Time	Auto Reset/Delay Trip	0.1 ~ 10sec.
Reset		Auto Reset
Indicator		Digital
Control Voltage	Voltage range	220VAC(L-N)
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢ 3 close
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<230gr.



Ordering

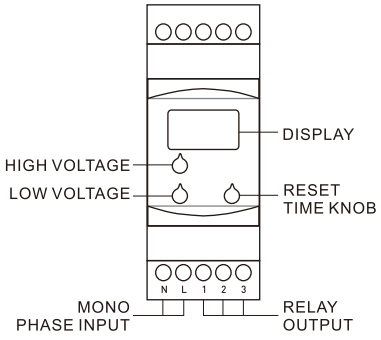
D G K - 0 1 W

① ②

①	Type		
②	Model	01	U>: 230 ~ 280VAC, U<: 150 ~ 210VAC
		01W	U>: 230 ~ 280VAC, U<: 110 ~ 210VAC

DGK-01C

Digital Mono Phase Voltage Control Relay



General Description

DGK Digital voltage relay is designed for preventing Mono phase devices to get harmed from long-term voltage fluctuations.

Protection

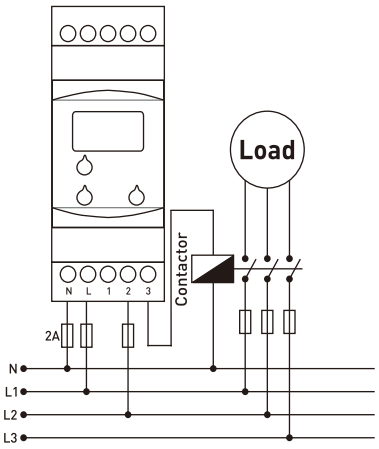
Protective Item	Operating (Trip) Time
High Voltage	3sec.(Fixed)
Low Voltage	3sec.(Fixed)

Auto Reset

When the fault is eliminated, DGK is automatically reset.

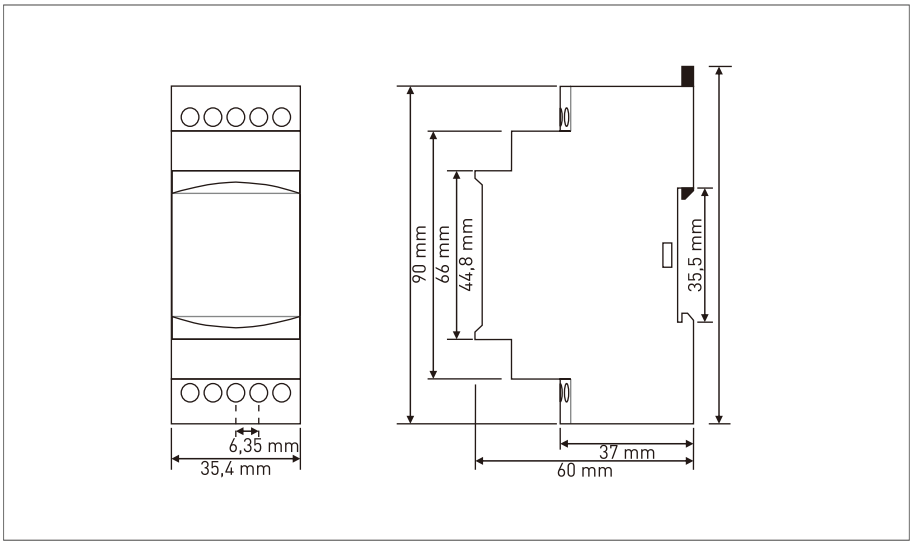
LED Indication

Model	Condition	U>(Red)LED	U<(Red)LED	OUT(GREEN) LED
DGK-01C	Normal Running	×	×	○
	High Voltage	○	×	×
	Low Voltage	×	○	×



Specifications

Type	Model	Function
	DGK-01C	U>: 230 ~ 280VAC, U<: 110 ~ 210VAC
Time	Trip delay	3sec.(Fixed)
	Auto reset	0.1 ~ 60sec.
Reset		Auto Reset
Indicator		Digital
Control Voltage	Voltage range	220VAC(L-N)
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢ 3 close
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<230gr.



Ordering

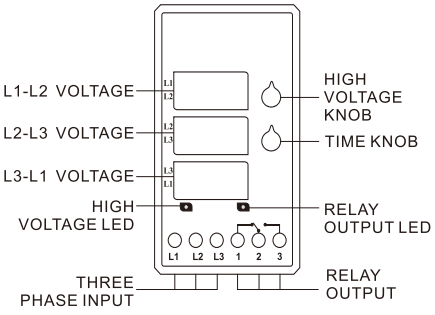
D G K - 0 1 C

①

①	Type	U>: 230 ~ 280VAC, U<: 110 ~ 210VAC

DGK-03 (Non Neutral)

Digital Three Phase Voltage Control Relay



General Description

DGK Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

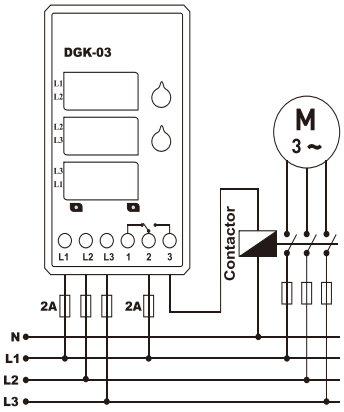
Protective Item	Operating (Trip) Time
High Voltage	Time Knob

Auto Reset

When the fault is eliminated, DGK is automatically reset.

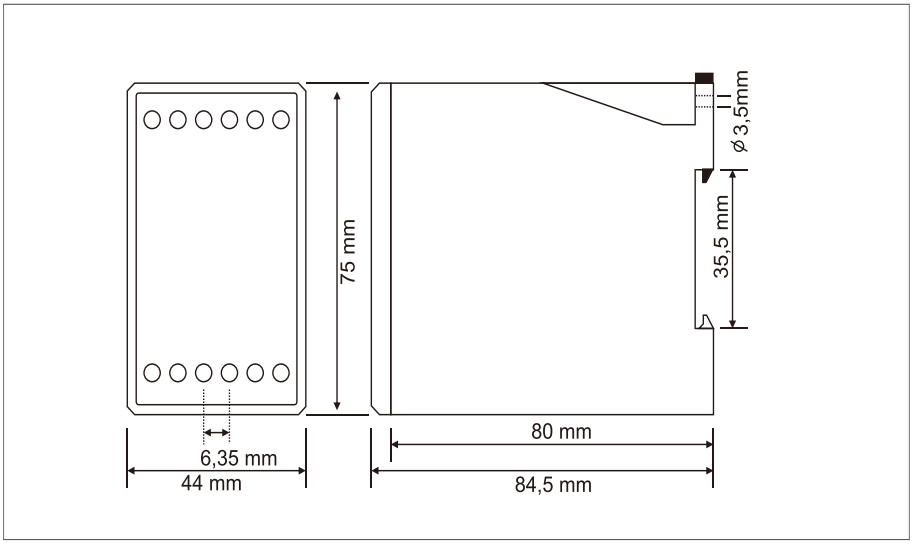
LED Indication

Model	Condition	U>(Red)LED	OUT(Red)LED	Display(Red)	Remarks
DGK-03	Normal Running	×	○	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	◑	



Specifications

Type	Model	Function
	DGK-03	U>: 400 ~ 460VAC
Time	Auto Reset/Delay Trip	0.1 ~ 10sec.
Reset		Auto Reset
Indicator		Digital
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢3 close
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<230gr.



Ordering

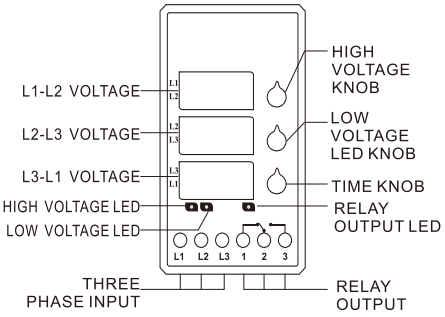
D G K - 0 3

①

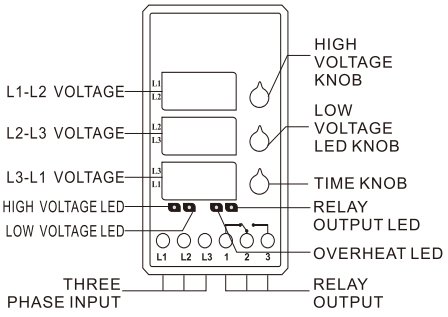
①	Type	U>: 400 ~ 460VAC

DGK-04 / DGK-04P (Non Neutral)

Three Phase Voltage Control Relay



※ For DGK-04



※ For DGK-04P

General Description

DGK Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time	
Model	DGK-04	DGK-04P
High Voltage	Delay Time Knob	
Low Voltage	Delay Time Knob	
Overheat	–	2sec.(Fixed)

Auto Reset

When the fault is eliminated, DGK is automatically reset.

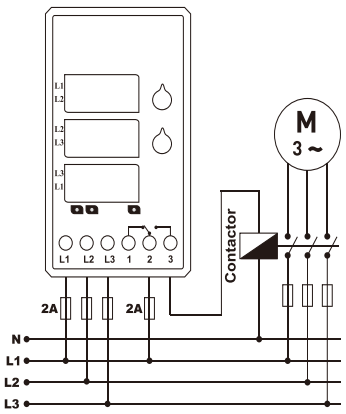
LED Indication

Model	Condition	U>(Red) LED	U<(Red) LED	OUT(Red) LED	Remarks
DGK-04	Normal Running	×	×	○	○:ON ×:OFF
	High Voltage	○	×	×	
	Low Voltage	×	○	×	

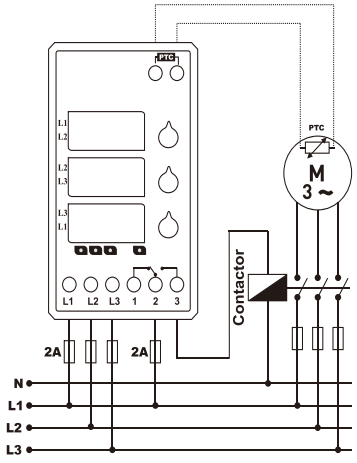
Model	Condition	U>(Red) LED	U<(Red) LED	PTC(Red) LED	OUT (Red) LED	Remarks
DGK-04P	Normal Running	×	×	×	○	○:ON ×:OFF
	High Voltage	○	×	×	×	
	Low Voltage	×	○	×	×	
	Overheat	×	×	○	×	

Specifications

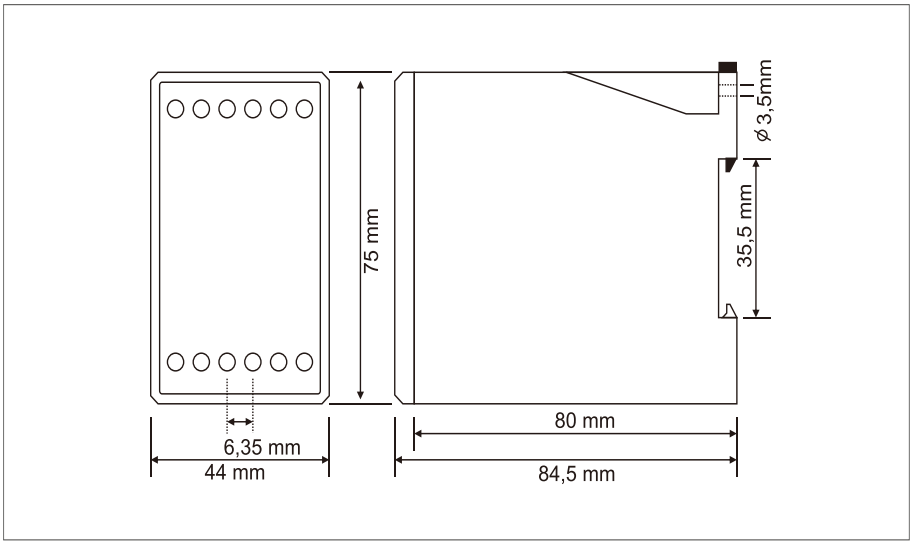
Type	Model	Function
	DGK-04	U>: 400 ~ 460VAC, U<: 230 ~ 360VAC
	DGK-04P	U>: 400 ~ 460VAC, U<: 230 ~ 360VAC; Overheat Production
Time	Auto Reset/ Delay Trip	0.1 ~ 10 sec.
Reset		Auto Reset
Indicator		Digital
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢3 close,
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<250gr.



※ For DGK-04



※ For DGK-04P



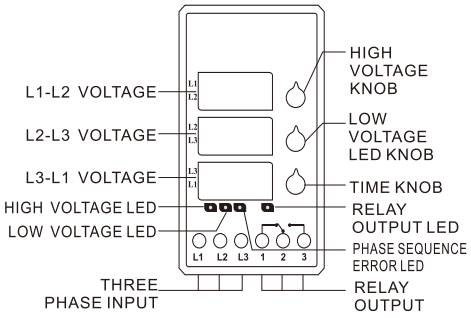
Ordering

D	G	K	-	0	4	P
	①			②		

①	Type		
②	Model	04	U>: 400 ~ 460VAC, U<: 230 ~ 360VAC
		04P	U>: 400 ~ 460VAC, U<: 230 ~ 360VAC; Overheat Production

DGK-04F / DGK-04PF (Non Neutral)

Three Phase Voltage Control Relay



※ For DGK-04F

General Description

DGK Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

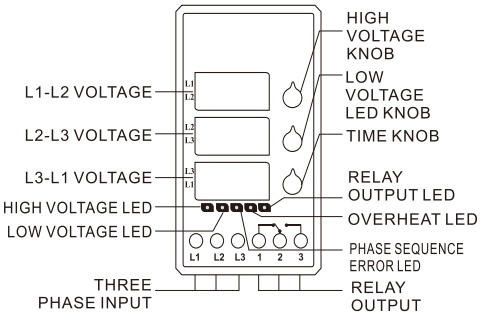
Protective Item	Operating (Trip) Time	
Model	DGK-04F	DGK-04PF
High Voltage	Delay Time Knob	
Low Voltage	Delay Time Knob	
Phase Sequence Error	Disable Relay Output	Disable Relay Output
Overheat	–	2sec.(Fixed)

Auto Reset

When the fault is eliminated, DGK is automatically reset.

LED Indication

Model	Condition	U>(Red) LED	U<(Red) LED	X1(Red) LED	OUT(Red) LED	Remarks
DGK-04F	Normal Running	×	×	×	○	○:ON ×:OFF
	High Voltage	○	×	×	×	
	Low Voltage	×	○	×	×	
	Phase Sequence Error	×	×	○	×	

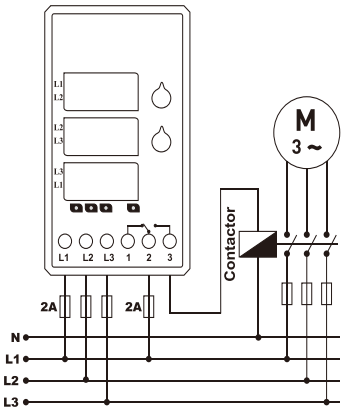


※ For DGK-04PF

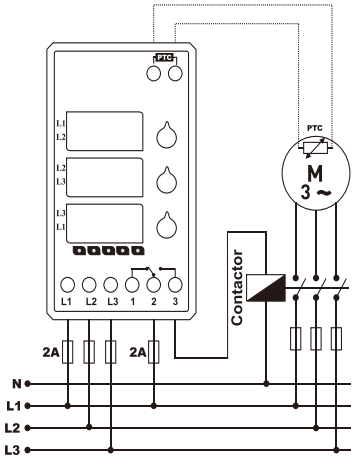
Model	Condition	U>(Red) LED	U<(Red) LED	X1(Red) LED	PTC(Red) LED	OUT(Red) LED	Remarks
DGK-04PF	Normal Running	×	×	×	×	○	○:ON ×:OFF
	High Voltage	○	×	×	×	×	
	Low Voltage	×	○	×	×	×	
	Phase Sequence Error	×	×	○	×	×	
	Overheat	×	×	×	○	×	

Specifications

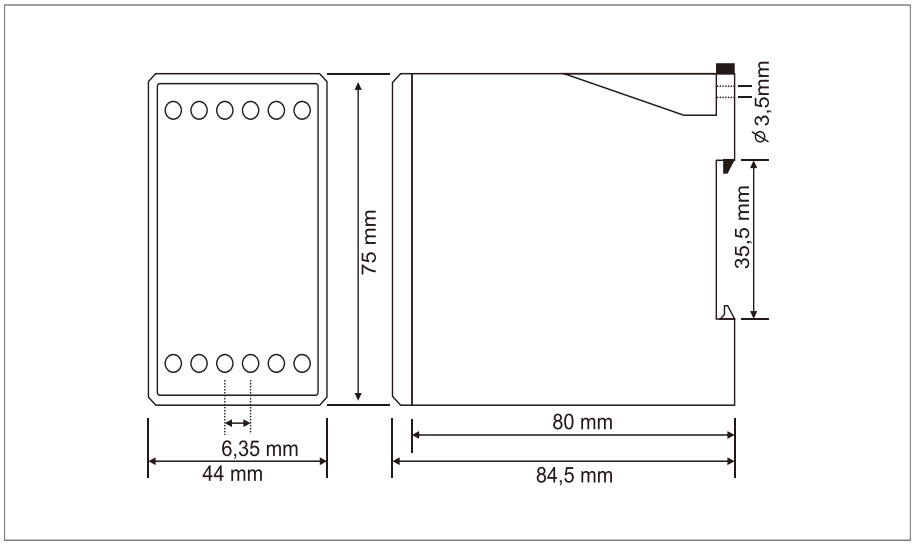
Type	Model	Function
	DGK-04F	U>: 400 ~ 460VAC, U<: 230 ~ 360VAC; Phase Sequence
	DGK-04P	U>: 400 ~ 460VAC, U<: 230 ~ 360VAC; Phase Sequence; Overheat Production
Time	Auto Reset/ Delay Trip	0.1 ~ 10 sec.
Reset		Auto Reset
Indicator		Digital
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	1-SPDT(1c)
	Condition	When normal running, 1 ⊣⊢ 2 open, 2 ⊣ ⊢ 3 close,
		When Trip, 1 ⊣⊢ 2 close, 2 ⊣ ⊢ 3 open
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail / Panel (Bracket Panel mounting)
Weight		<250gr.



※ For DGK-04F



※ For DGK-04PF



Ordering

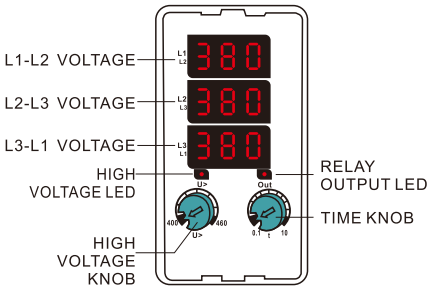
D G K - 0 4 F

① ②

①	Type		
②	Model	04F	U>: 400 ~ 460VAC, U<: 230 ~ 360VAC; Phase Sequence
		04PF	U>: 400 ~ 460VAC, U<: 230 ~ 360VAC; Phase Sequence; Overheat Production

DGS-03

Digital Three Phase Voltage Control Relay (Non Neutral) (Pin Type)



General Description

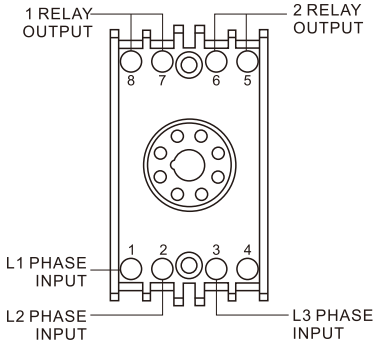
DGS Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time
High Voltage	Time Knob

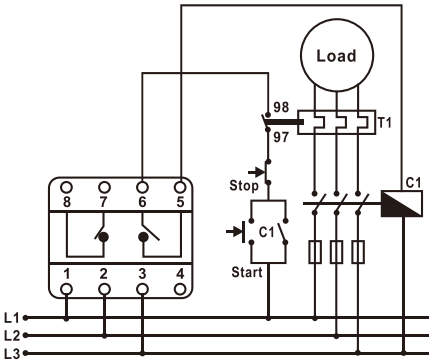
Auto Reset

When the fault is eliminated, GK is automatically reset.



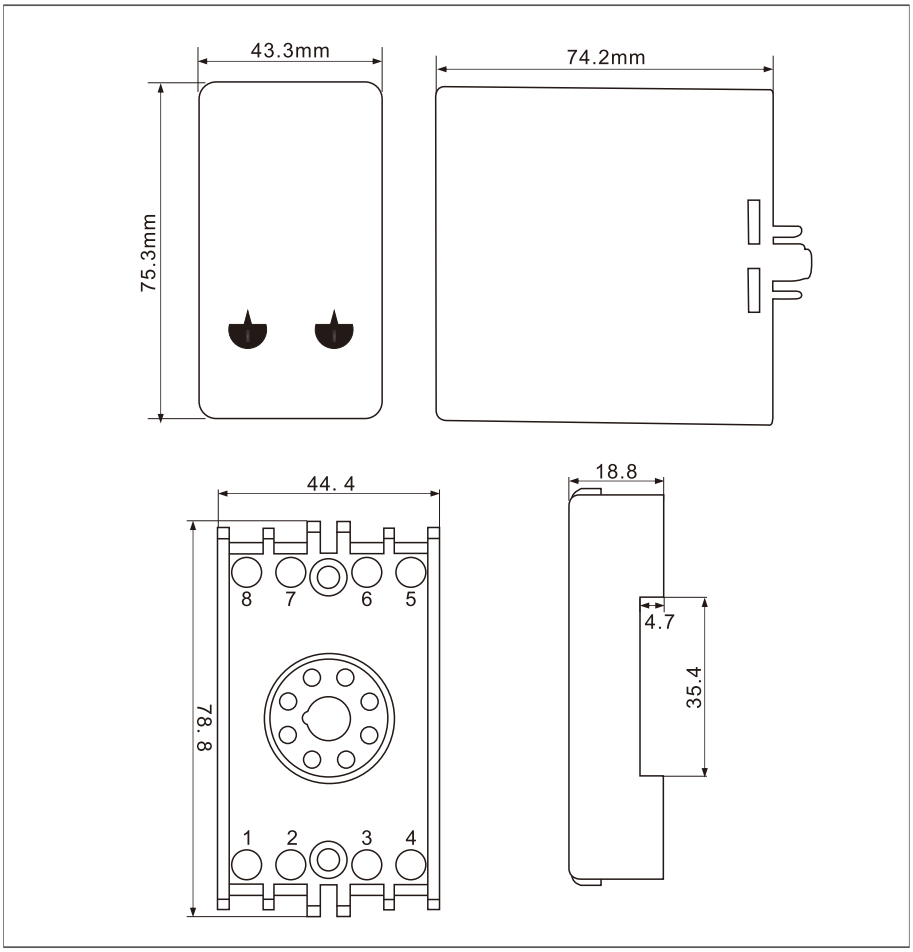
LED Indication

Model	Condition	U>(Red)LED	OUT(Red)LED	Display(Red)	Remarks
DGS-03	Normal Running	×	○	○	◑:Blink ○:ON ×:OFF
	High Voltage	○	×	◑	



Specifications

Type	Model	Function
	DGK-03	U>: 400 ~ 460VAC
Time	Auto Reset/Delay Trip	0.1 ~ 10sec.
Reset		Auto Reset
Indicator		Digital
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	2-SPDT(1NO1NC)
	Condition	When normal running, 5 ┤ ├ 6 close, 7 ┤ ├ 8 open
		When Trip, 5 ┤ ├ 6 open, 7 ┤ ├ 8 close
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		<250gr.



Ordering

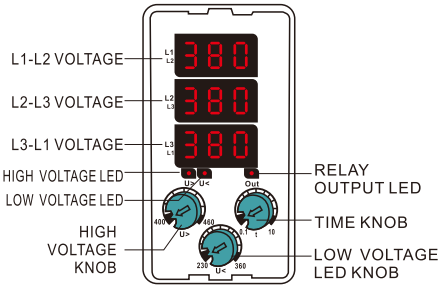
D G S - 0 3

①

①	Type	U>: 400 ~ 460VAC

DGS-04 / DGS-04F

Three Phase Voltage Control Relay (Non Neutral) (Pin Type)

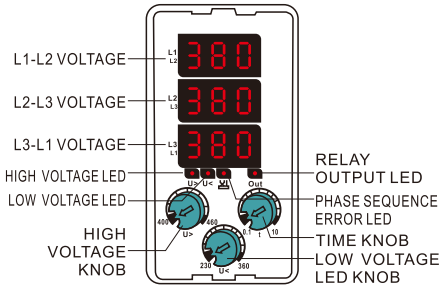


General Description

DGS Voltage control relay are designed to protect devices with sensitive operating voltage values from failures that may be caused by mains voltage.

Protection

Protective Item	Operating (Trip) Time	
Model	DGS-04	DGS-04F
High Voltage	Delay Time Knob	
Low Voltage	Delay Time Knob	
Phase Sequence Error	–	Disable Relay Output

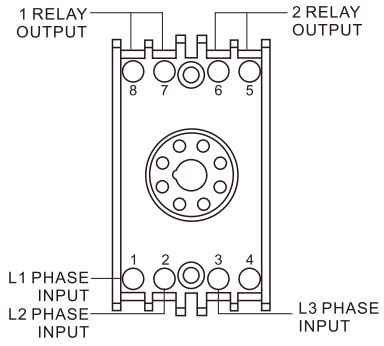


Auto Reset

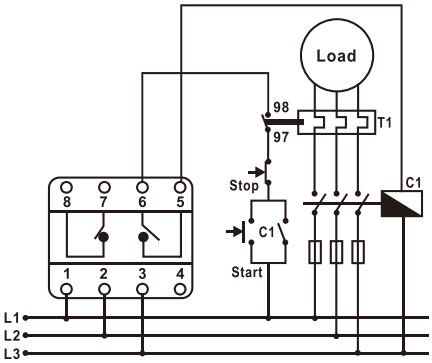
When the fault is eliminated, DGS is automatically reset.

LED Indication

Model	Condition	U>(Red) LED	U<(Red) LED	OUT(Red) LED	Remarks
DGS-04	Normal Running	×	×	○	○:ON ×:OFF
	High Voltage	○	×	×	
	Low Voltage	×	○	×	

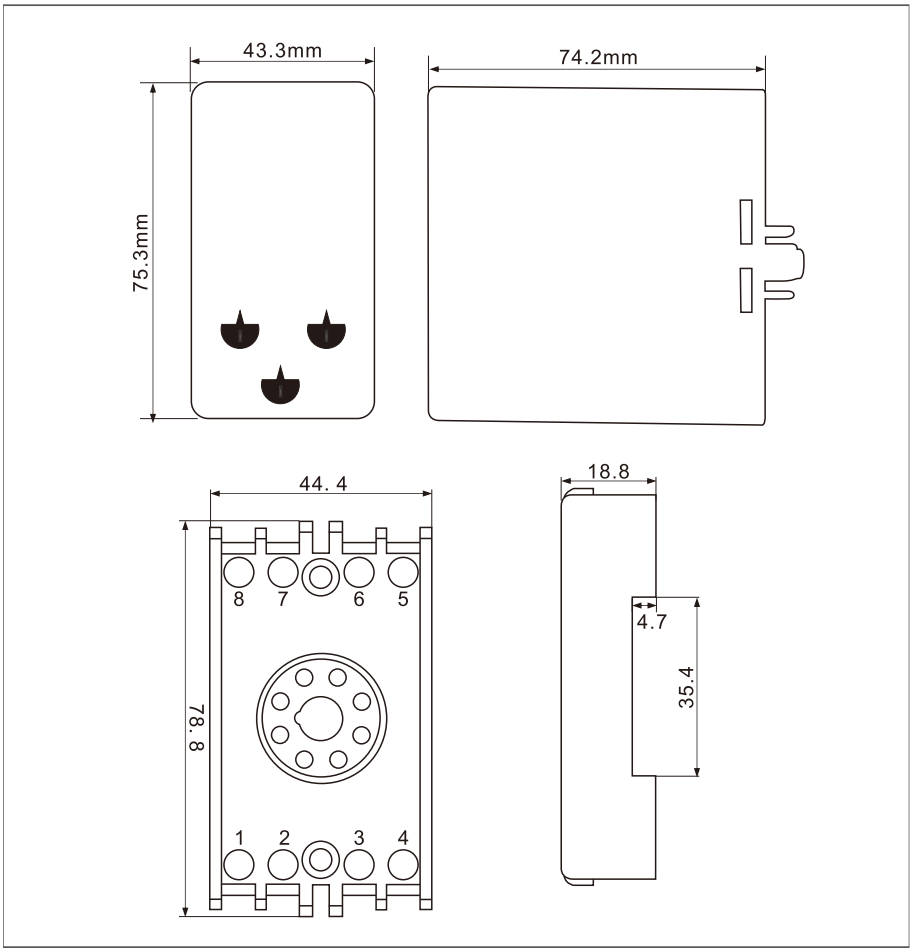


Model	Condition	U>(Red) LED	U<(Red) LED	X1(Red) LED	OUT (Red) LED	Remarks
DGS-04F	Normal Running	×	×	×	○	○:ON ×:OFF
	High Voltage	○	×	×	×	
	Low Voltage	×	○	×	×	
	Phase Sequence Error	×	×	○	×	



Specifications

Type	Model	Function
	DGS-04	U>: 400 ~ 460VAC, U<: 230 ~ 360VAC
	DGS-04F	U>: 400 ~ 460VAC, U<: 230 ~ 360VAC; Phase Sequence
Time	Auto Reset/ Delay Trip	0.1 ~ 10 sec.
Reset		Auto Reset
Indicator		Digital
Control Voltage	Voltage range	3x380VAC
	Frequency	50/60Hz
Output	Contact	2-SPDT(1NO1NC)
	Condition	When normal running, 5 ⊣ ⊢ 6 close, 7 ⊣/⊢ 8 open
		When Trip, 5 ⊣ ⊢ 6 open, 7 ⊣/⊢ 8 close
Electrical life at rated load in Ac1		$1x10^5$
Temperature		-20 ~ +55℃
Mounting		35mm DIN-Rail
Weight		<320gr.



Ordering

D G S - 0 4 F

① ②

①	Type		
②	Model	04	U>: 400 ~ 460VAC, U<: 230 ~ 360VAC
		04F	U>: 400 ~ 460VAC, U<: 230 ~ 360VAC; Phase Sequence