

MULTI FUNCTION EARTH LEAKAGE DETECTOR & FIRE ALARM



Facilities requiring installation of leakage detection and fire alarm devices:

(As per the enforcement laws articles 17-8, 18-6, and 19-7 of the laws for prevention and extinguishing of fires)

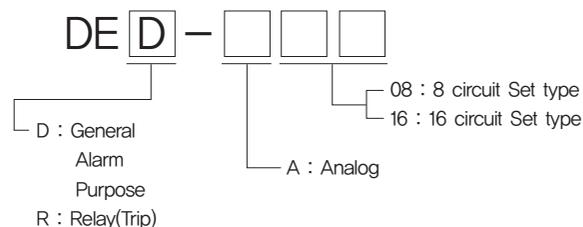
Objective facilities	Aggregated area	Contract current capacity
Class I facilities per article 17-8 -Theaters, Stadiums -Conference halls, Restaurants -Public markets, Supermarkets -Hotels, Motels -Dorm Inatories -Hospitals -Welfare institution for the seniors -Welfare institution for the handicapped -Kindergartens -Bathhouses	300m ² or more All lines below same as above	Above 100A All lines below same as above
Class II facilities per article 18-6 -Rail stations & Bus terminals -Passenger' s waiting rooms -Churches & Temples -Multi-family housings of 4 stories and up -Schools -Exhibition halls -Factories and Work places	500m ² or more All lines below same as above	Above 100A All lines below same as above
Class III facilities per article 19.7 -Warehouse -Garages -Hangars	100m ² or more All lines below same as above	Above 100A All lines below same as above

MULTI FUNCTION EARTH LEAKAGE DETECTOR & FIRE ALARM



Optional Specification

- (For example)
- DED-A08, A16 : Set ANALOG type
ELD 8, 16 circuit
 - DER-A08, A16 : Set ANALOG type
ELD 8, 16 circuit

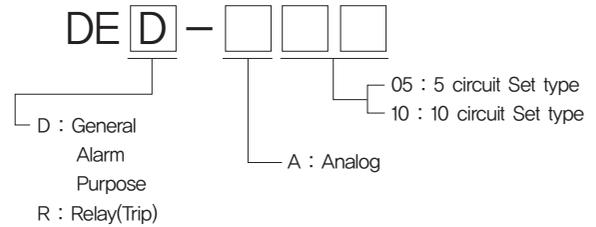


Rating and Performance

Description		Analog type			
Model No		DED - A16	DED - A08	DER - A16	DER - A08
Type approval No		10-2	10-1	10-4	10-5
Installation		16c, 08c Flush mounted			
Auxiliary voltage		AC / DC 110 ~ 220V			
Frequency		50/60Hz			
Nominal operating current		0.2 - 0.5 - 1.0			
Current	Operating	53% ~ 75% of nominal operating current within 1sec			
	Non operating	52% nominal operating current within 30sec			
Allowable supply voltage fluctuation		80% ~ 120% of Rated Voltage			
Reset		Manual / Auto (Multi type)			
Warning circuit voltage		Less than AC 600V			
LED indicator		Leaking circuit indicator : LED(Red color) Detector indicator : LED(Red color) Power indicator : LED(Green color) ZCT penetration indicator : LED(Yellow color) Continue/Auto-alarm : LED(Yellow color) Buzzer alarm : LED(Yellow color) Detector alarm indicator : LED(Red color)			
Power consumption	Non operating	8VA	6VA	9VA	7VA
	Operating	9VA	7VA	10VA	8VA
ZCT(Input)		200mA/100mV			
Ambient temperature		-10°C+50°C			
Sound level		Buzzer(more than 75dB)			
Insulation resistance		Primary-case } Insulation resistance } Secondary-case more than 100MΩ (DC 500V megger) Primary-Secondary }			
Dielectric strength		Primary-case : 1500V } Secondary-case : 500V } AC 600Hz, 1minute Primary-Secondary : 1500V }			
Impluse wave withstand voltage		Between-termina Peak value : 6.0kV, 1,2/50μs Power terminals-case			
Vibration strength		On duty:Full wave width 1mm, 1000rpm, 10min, Not on duty:Full wave width 4mm, 1000rpm, 60min			
Mechanical shock resistance		On duty:Natural drop 15times Not on duty:Accelebration of 5kg Max force in any direction for 5 times			
Contact point capacity		AC 250V 3A, DC 30V 5A		AC 250V 0.5A, DC 30V 2A	
Rate of fuse		0,2A			
Weight		1,5kg	1,3kg	1,8kg	1,6kg
Casing		ABS Resin/Black N1,5(Non-flammable)			

Optional Specification

- (For example)
- DED-M10 :Set Digital type
ELD 10 circuit
 - DED-A05 :Set ANALOG type
ELD 5 circuit



Rating and Performance

Description		Micom type		Analog type	
Model No		DED-M10(10C)	DED-M05(5C)	DED-A10(10C)	DED-A05(5C)
Type approval No		07-4	07-5	07-17	07-12
Rated supply voltage		AC:110/220V in common			
Rated supply frequency		50/60Hz			
Nominal operating current		0,2~0,5~1,0A(3 steps) ZCT Input:200mA/100mV			
Current	Operating	53%~75% of nominal operating current within 1sec			
	Non operating	52% nominal operating current			
Allowable supply voltage fluctuation		80%~120% of rated supply voltage			
Reset Method		Manual/Automatic			
Warning circuit voltage		Below AC 600V			
LED indication		Leakage level:Digital Leaking circuit:RED LED Warning:RED LED Power supply:GREEN LED ZCT continuity:YELLOW LED Cont/Auto-alarm:YELLOW LED Buzzer alarm:YELLOW LED		Leaking circuit: RED LED Warning:RED LED Power supply:GREEN LED ZCT continuity:YELLOW LED Cont/Auto-alarm:YELLOW LED Buzzer alarm:YELLOW LED	
Power consumption		3,5VA	3,0VA	8VA	6VA
Operating		6,0VA	5,5VA	9VA	7VA
Ambient temperature		-10°C(Thru + 50°C)			
Sound level		Buzzer(more than 75dB)			
Insulation resistance		Primary-case Secondary-case } 100MΩ or more (Tested by 500V megger) Primary-Secondary }			
Dielectric strength		Primary-case : 1500V Secondary-case : 500V } AC 60Hz, 1min Primary-Secondary : 1500V }			
Impulse wave withstand voltage		Between terminals — Peak value:6.0kV, Duration of wave front:0,5~1,5ms Power supply terminals to case — Duration of wave tail:30~50ms and up			
Vibration strength		On duty:Full wave width 1mm, 1000rpm, 10min Not on duty:Full width 4mm, 1000rpm, 60min			
Mechanical shock resistance		On duty:Natural drop 15 times Not on duty:Accelebration of 5kg Max force in any direction for 5 times			
Contact point capacity		1a:AC 250V,0,5A or DC 30V, 2A / contact			
Fuse rating		0,1A		0,2A	
Weight		1,9kg	1,7kg	2kg	1,9kg
Casing		ABS Resin/Black N1,5			
Mounting method		Flush mounting			

MULTI FUNCTION EARTH LEAKAGE DETECTOR & FIRE ALARM [DIGITAL]

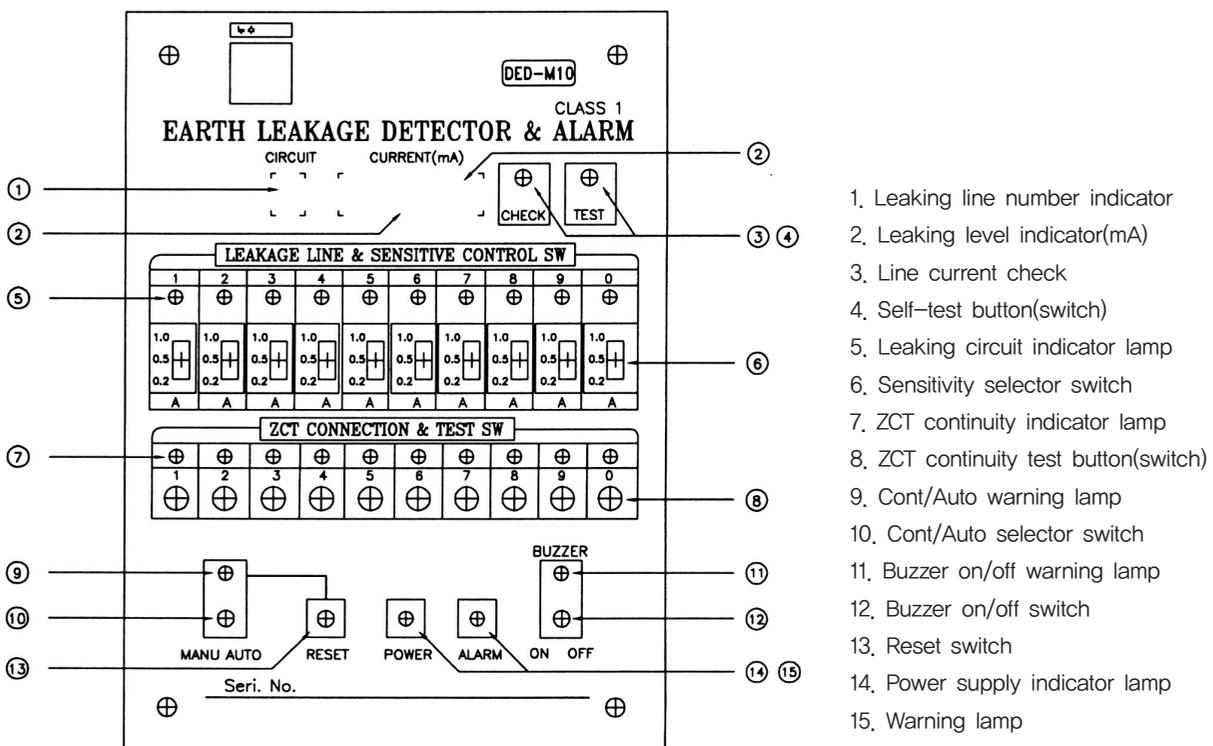
DED-M10



Characteristics

1. Multi type earth leakage detector has alarm or CB trip function with detecting multi circuit leakage.
2. As equipped with MCU(A/D converter) at main circuit, it is multi function earth leakage alarm unit with digital display for detection circuit.
3. Available to check leakage current amount and leakage lines.
4. As equipped with self detecting system, easy to check operation condition stably with various LED indication function.
5. Self detecting and checking system make it be easy to inspect internal circuit.

Front plate



1. Leaking line number indicator
2. Leaking level indicator(mA)
3. Line current check
4. Self-test button(switch)
5. Leaking circuit indicator lamp
6. Sensitivity selector switch
7. ZCT continuity indicator lamp
8. ZCT continuity test button(switch)
9. Cont/Auto warning lamp
10. Cont/Auto selector switch
11. Buzzer on/off warning lamp
12. Buzzer on/off switch
13. Reset switch
14. Power supply indicator lamp
15. Warning lamp

Performance Features

1. Being a set type leakage detector, it sets and monitors plural number of line circuits simultaneously and features a combination of power supply and alarm system in a unit.
 2. According to line monitoring instruction from MCU, it monitors all lines hooked simultaneously.
 3. In case leakage is developed in any monitored line, the residual current transformer generates voltage which is fed to the leakage detection circuit of receiver as an input.
 4. The input is amplified and then fed to MCU for processing.
 5. At MCU, amplified input is converted by A/D converter for comparison against the voltage one of selected sensitivity. And if a ratio higher than predetermined value is obtained, warnings become activated as follows ;
 - 1) Alarm lamp(Red LED) turns on.
 - 2) Buzzer–alarm.
 - 3) Leakage fault line indicator lamp(Red LED) of subject line turns on.
 - 4) Leaking line number is circuit indicator.
 - 5) Leakage level indicator displays level of leakage in mA unit.
- Note 1 : When Cont/Auto switch is set to auto. position, warning lamp(Yellow LED) will blink and when the leakage stops, all warnings and alarm will be canceled.
- Note 2 : When buzzer on/off switch is set to off position, warning lamp(Yellow LED)will blink and will not alarm if the leakage exceeds the criterion.
6. Clarification of warning indications in case two or more lines is leaking concurrently, the leaking line indicator lamps of such line will all light concurrently, but the leaking line number indicator and leaking level indicator will display the value of first detected line only. Leaking level of other lines can be checked by pressing the line test switch(Tact type).
 7. Reset if Cont/Auto switch remains after the leakage is removed, reset to cont, position.

Component Parts and Functions

1. **Leaking circuit indicator**
It indicator leakage fault circuit number on LED.
2. **Leakage level indicator**
It indicates the level of leakage in mA unit.
3. **Circuit test button(Tact type)**
At each time button(or switch)is pushed, circuit is newly selected one by one with the indication of circuit number and level of leakage. It is convenient to check levels of leakages of each line though it happens in plural number of circuits at a time.
4. **Self–test switch(Tact type)**
It is used to check as a whole any abnormality in performance of every functional components like leaking circuit indicator, leakage level indicator, leakage fault line indicator lamps, cont./auto warning lamp, alarm lamp and buzzer warning lamp.
5. **Leakage fault indicator lamp by line(Red LED)**
In case to leakage fault, the lamp of subject line turns on uncondition of continuity button(or switch) is pressed or self–test switch is pressed.
6. **Sensitivity selector switch**
Sensitivity is adjusted by the switch to an one among three steps of 0,2,/0,5/1,0A as appropriate to specific line.
7. **ZCT continuity indicator lamp(Yellow LED)**
It lights to indicate continuity.
8. **ZCT continuity switch(Push button type)**
If the switch is pressed on condition that current transformer is connected to applicable line terminals of the receiving part, the continuity lamp of the line turns on enabling to perform leakage test in simulated circumstance of real leakage.
9. **Continue/Auto warning lamp(Yellow LED)**
10. **Continue/Auto selector switch**
If Auto, position is selected by Cont/Auto switch, the continue/Auto selection warning lamp blinks to call attention on the setting.
11. **Buzzer on/off warning lamp(Yellow LED)**
12. **Buzzer on/off selector switch**
If the switch is set to off, the buzzer on/off warning lamp blinks to warn the selected switch position.
13. **Reset switch**
If pressed, it activates entire receiver function to initial status.
14. **Power supply indicator lamp(Green LED)**
It turns on only when power(AC110–220)(AC240V) is supplied normally.
15. **Alarm lamp(Red LED)**
It lights in case of leakage occurrence and testing.

MULTI FUNCTION EARTH LEAKAGE DETECTOR & FIRE ALARM [DIGITAL]

Checking Items Before Installation

The following points should be checked before installation to ensure operability.

1. Connect control power(AC 220V) to terminals P0 and P1 of ELD(Note: Since the control power is set to AC220V at factory on delivery, convert slide switch on the back of ELD to AC110V if it is used AC110V for control power)
2. After connecting control power to the terminals, set power on/off switch to “on” position to energize the detector(Red LED turns on).
3. Check digital display of leaking line number indicator and leaking level indicator by pressing line test switch(Tact type). Every time the switch is pressed the line number on display advances to very next higher number in burn and the leakage level indicator will display zeros. After an elapse of about 5 minutes without additional pressing, the indications will disappear automatically.
4. Check internal circuits by pressing selftest switch. If the switch is pressed, all displays and alarms turn back initial stage automatically one by one except the continuity indicator lamp(Yellow LED) At that times the display of leaking line indicator changes the display sequence by with steps by one at each time when the switch is pressed and leakage level indicator will unchange to show Adn thus check of digital segment is accomplished.
5. Check lines by pressing line test and ZCT continuity switch. When line test switch is pressed, line leakage indicator LED and alarm LED turn on. And leaking line number indicator will display leaking current of subject line number. After checking all items, return in initial stage by pressing the return s/w
6. Repeat checks of paragraph 5. set Cont/Auto switch to Auto. Position(LED blinks) and buzzer on/off switch to off(LED blinks). At this time, the buzzer does not sound and all indicators return to automatically.(Note: ZCT continuity indicator LED (Yellow) will turn on only when ZCT is connected before the continuity test is performed.)
7. After completion of all check ups in preceeding paragraphs, set the power on/off switch to ‘off’ and take off control power from the terminals.

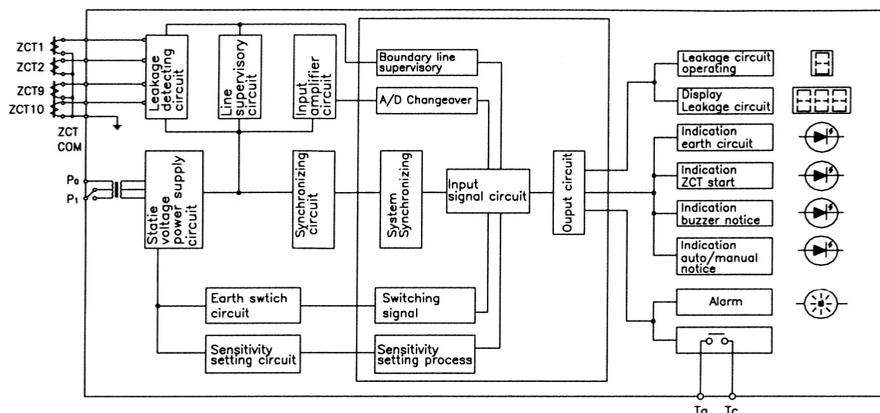
Checking Items before Installation

1. Arrange a mounting panel suitable to the receiver and install it on the desired location
2. Install ZCT on lines to monitor.
 - 1) Select ZCT of adequate capacity for each line.
 - 2) install ZCT lotated at 10cm or more distance current bus or strong magnet field
 - 3) Install ZCT on load side whether the power supply is single phase or 3 phase.
 - 4) In case of 3 phase 4 line system, all 4 lines including the neutral should go through the ZCT.
3. Connections to terminals on back of receiver
 - 1) The one terminal of ZCT,s two terminals (not distinction of the polarity) should be connected to line terminals ①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩ and the other terminal which is the common shall be to common terminal ② of the receiver.
 - 2) The Terminal Ta and Tc(no voltage contacts) are used when a buzzer is installed on the outside.
 - 3) The terminal E for grounding should be connected to the grounding terminal of distribution board.
4. The control power of receiver should be connected an independent source which is not distributed from main source

Checking Items After Installation

1. Check whether the power lamp is turned on or not
Press circuit test switch and ZCT continuity switch during
- 2, about one second and Check whether circuits are in normal status and ZCT continuity indicator lamp turns on. If the lamp do not turn on, please check up the connection of respective terminals.
3. Please Initialize entire receiver function by pressing reset button.
4. Check levels of leakage on each circuit by pressing circuit test switch.
5. In case of a leakage exceeding the criterea, leaking circuit number indicator and leakage level digital indicator will display the first detected leaking circuit number and its level of leakage while leakage fault indicator lamps will indicate leaking lines individually.
6. If the leakage level exceeds 1.0A, the 999 will display on the leakage level indicator.

Internal block diagram



MULTI FUNCTION EARTH LEAKAGE DETECTOR & FIRE ALARM [ANALOG]

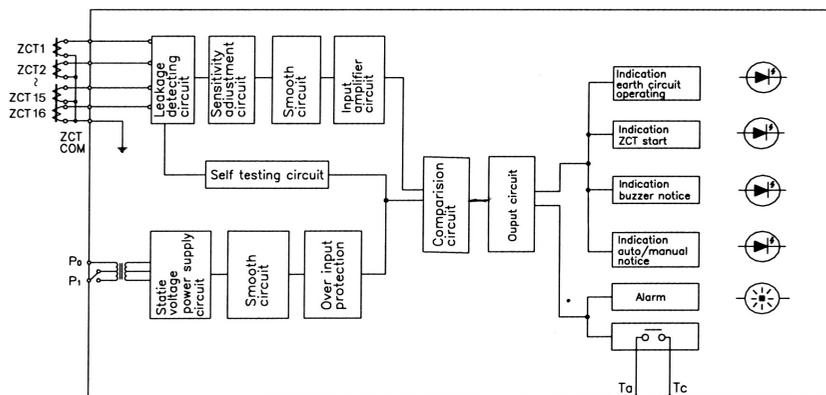
DED-A08, 10, 16



Performance Features

1. In case of leakage, output voltage that is induced in the current transformer is stored to leakage detection circuit.
Receiver adjusts input voltage deriving to leakage to sensitivity scale for comparison with the criterion. And if the value is determined to be exceeding the criterion, it generates warning and alarm as follows.
 - 1) The alarm lamp (Red LED) turns on.
 - 2) The buzzer sound on to sign the fault.
Note : If buzzer on/off switch is set to off, position buzzer on/off lamp will blink without sounding.
 - 3) Leaking circuit indicator lamp (Red LED) of the applicable circuit turns on or off.
Note : If Continue / Auto switch is set to Auto position, continue / Auto warning lamp will blink. When the leakage is stopped or the circuit is recovered to normal state, the alarms of subparagraphs 1) and 2) will automatically disappear.
3. Reset
If Continue / Auto switch is set to continue position, press reset button to initialize receiver function as soon as the leakage defect is removed.

Internal block diagram



Checking Items Before Installation

Note : Check following items to ensure normal function of the device before installation

1. Connect power line (AC 220V) to terminals P0 and P1 of the receiver and set power on/off switch to on position.
(The power is set to AC 220V at factory for delivery. If AC 110V is used, set the position of selector switch to AC 110V position.)
2. When power lamp (Green LED) is turned on to indicate normal status, carry out circuit tests by pressing circuit test switch and act continuity switch for each circuit. When circuit test switch of a line is pressed, leakage indicator LED and warning LED of the circuit turn on with alarm. When the test is over, initialize all the function by pressing reset button.
3. Repeat the testing explained in above paragraph 2 with Cont/Auto switch that is set to Auto position and buzzer on/off switch that is set to off position. In this instance, /and buzzer will not sound and all the indicators will return to normal status automatically.
(Note : ZCT continuity LED will light only when ZCT is connected to circuit terminals and continuity test switch is pressed).
4. After the completion of above tests, return the power switch on back panel that is set to off and then remove power connection

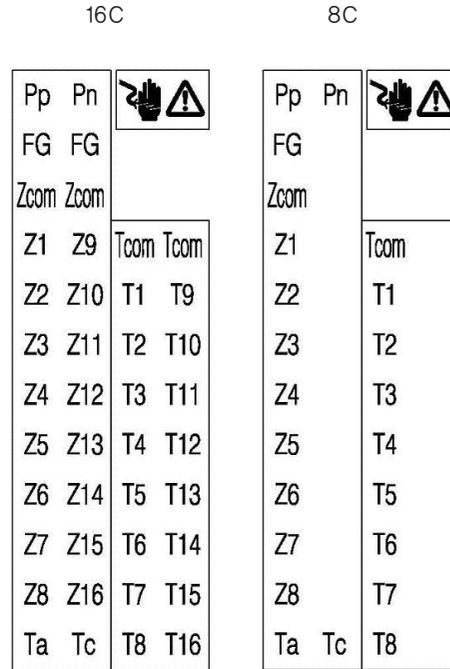
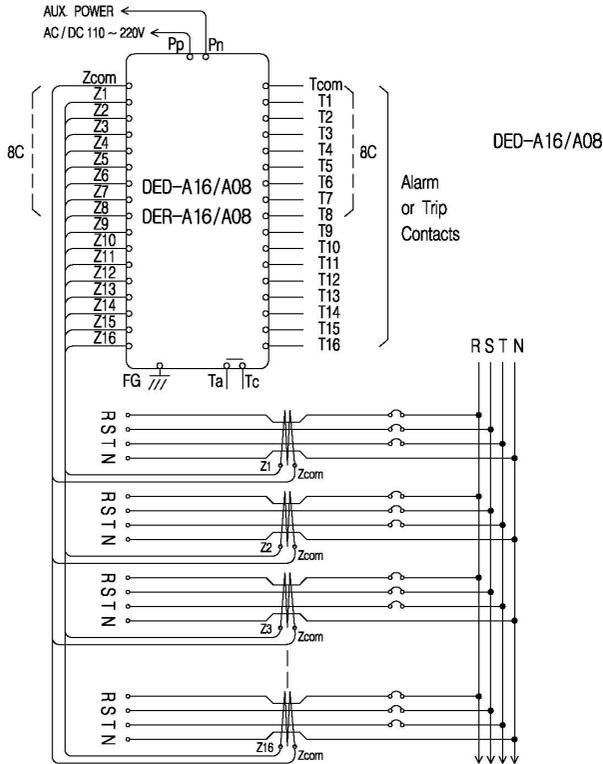
Checking Items After Installation

1. Check whether power supply lamp is turned on or not
2. Press circuit test switch and ZCT continuity switch. And check whether if circuit state indicator lamp and ZCT continuity indicator lamp of the circuit turn on. If no, check connections of terminals.
3. Initialize the performance of receiver by pressing reset button.

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External Wiring

Terminal Plate (Rear Panel)

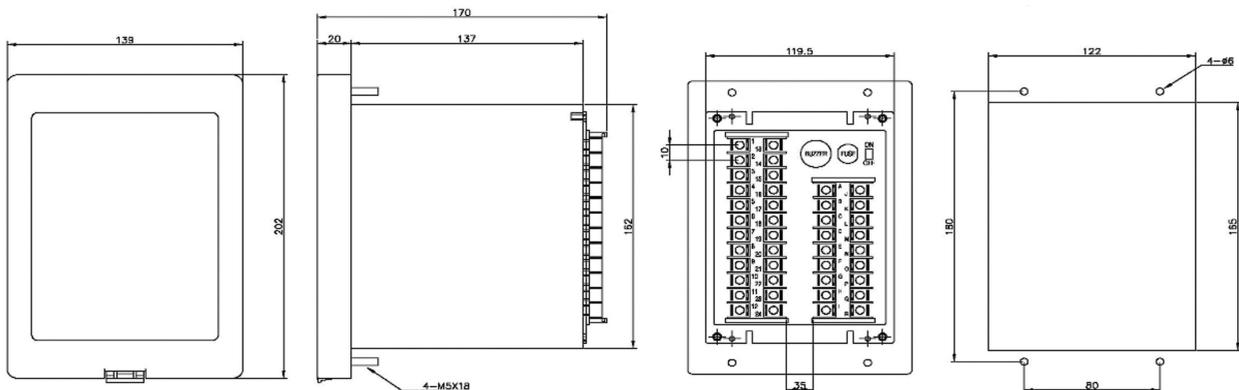


- Pp : Control Power (+)
- Pn : Control Power (-)
- E : Earth
- C+ : RS-485 comm, port (+)
- C- : RS-485 comm, Port (-)
- Z1 ~ Z16 : ZCT Input (+)
- Zcom : Zct Input (-) (Common)
- T1 ~ T16 : Output electric contact (+)
- Tcom : Output electric contact (-) (common)
- TA : common output electric contact (+)
- TC : common output electric contact (-)

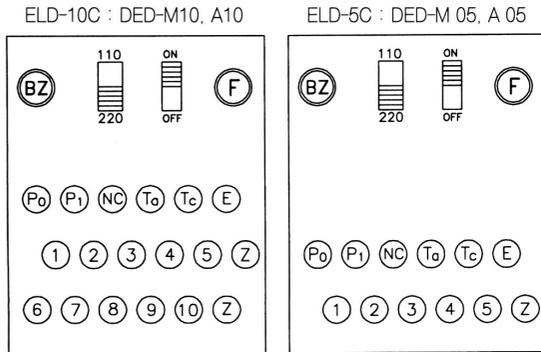
External Dimension

ELD 8C/16C GFR 8C/16C

Cutting size: 165X122mm

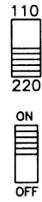


External terminal arrangement



BZ:BUZZER

: AC 110/220 Selection S/W



: Power ON/OFF S/W

Ⓣ: FUSE

P0, P1 : 110/220V Common

Ta Tc : Warning relay contacts(no voltage)

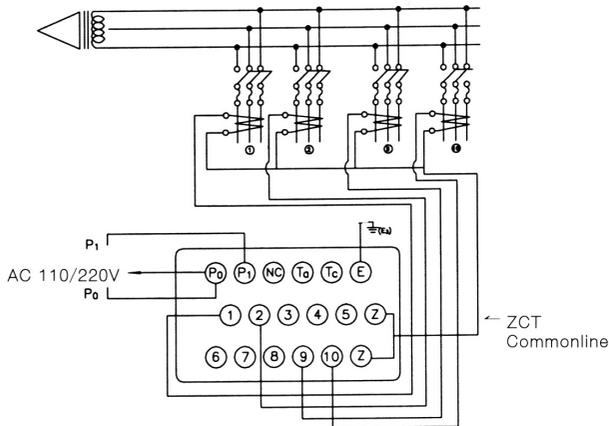
1~10 : ZCT Secondary circuit terminals

Z : ZCT Secondary circuit common terminal

E : Grounding terminal

NC : Idle terminal

Leakage detector external wiring



1. In case of 3 phase 4 line power system, go through all 4 lines into ZCT.
2. Control power shall be connected to P0 and P1 for AC 110/220V in common(Check setting of voltage selector switch).
3. Terminal Ta and Tc, (no voltage) is used to connect externally installed buzzer and warning lamps.
4. Terminal Z is common to all circuits. That all common terminals shall be connected to terminal Z.
5. Terminal E is for grounding, It should be connected ground terminal on terminal Z.
6. Use power service outlet for it self alone without tapping.

External dimension(ELD-M10/M05,ELD A10/A05)

