D2K-ED SERIES EARTH LEAKAGE DETECTOR & RELAY

Feature

The Number of Digital Alarm Circuits (Feeders)

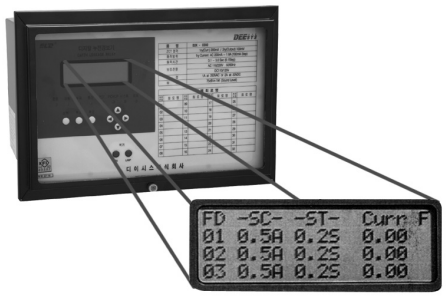
There are a 8–circuit and 32–circuit model. The 8–circuit model can be adopted without additional efforts to re–process the fixing hole, as its dimension is identical to the panel of the 10–circuit detector (Static & Mycom Model), which has been sold by us. The 32–circuit model can be chosen among 8, 16, 24 and 32 circuits according to the number of branch circuits to be used and the number of circuits expected to extend. You may want to initially install 16–circuit model and then purchase an additional 8–circuit module each time you install a branch circuit. The 32–circuit case measures two third of a 19 inch rack.

Overview

The earth leakage detector, approved under section 2 and 3, Article 24 of the regulations relative to the enforcement of the Fire Service Act, is a state–of–the–art digital multi–circuit detector developed for the purpose of preventing fires that may be started by electric shocks or electric leakages caused by the poor insulation of electric equipment on the side where the bifurcation load occur in AC circuits below 600V. The detector consists of visual current transformers (special ZCT) and electric leakage detector. It has been designed to respond according to accurate electric leakage values obtained by blocking the various types of noises, which are present in input signals, with an analog and digital filter and only by converting normal signals. It has an in–built 16 bit micro–processor and can store the operating status of each circuit and time period (second / minute / day / month / year) up to 10 times. The central monitoring PC can monitor each circuit's status with a communication system, and up to 32 devices can be connected through in–built RS485 ports. The communication line can be extended up to 1km and an included monitoring software allows to connect to PC through RS485/RS232 interfaces.

Display Mode

Present current leakage of each circuit is displayed on the LCD screen by rotation in real–time.



Fault Memory

Up to 10 rounds (No. of operations) are saved.

〈Details to be saved〉

1) Fault Date(Day/Month/Year)
2) Fault Time(Second/Minute/Hour)
3) Fault Feeder(Circuit)
4) Fault Current(Amount of current leakage)

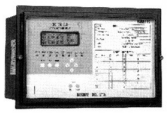
Operating current and time setting

It allows you to set operating time in a range of 0.1 to 3.0 seconds in a unit of 0.1 second so that leakage current, which may occur as a result of temporary imbalance, can be controlled with a deviation of ±50mS.

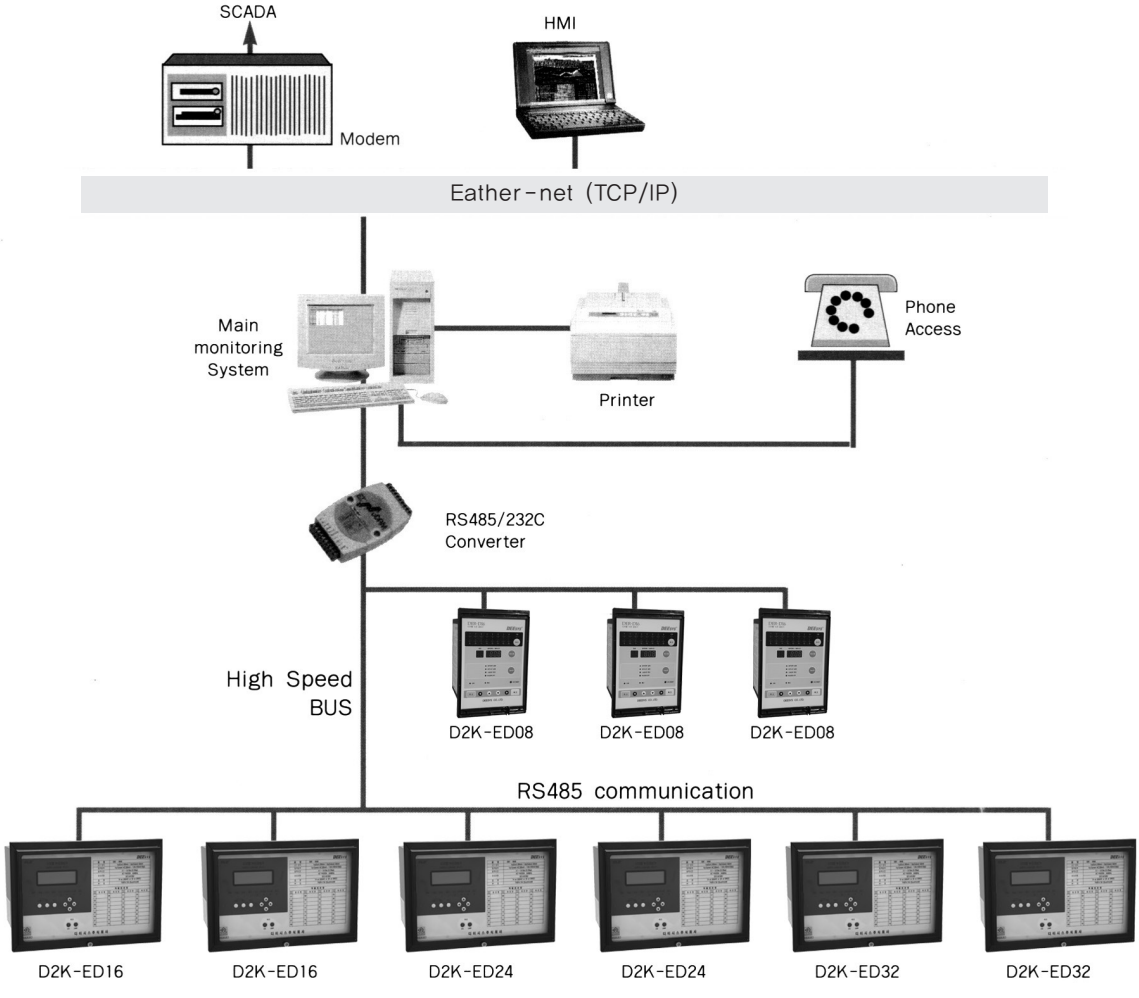
Communication and Monitoring

The detector is equipped with RS–485 ports to enable remote monitoring and controlling, and up to 32 detectors can be connected as a group within about 1km(communication wiring). They can be monitored and configured by the central monitoring system as below.

- Viewing present leakage current
- setting operating current and time
- Viewing saved operating status
- checking operating date/hour/minute/second



Typical substation architecture



Communication for Specification

- com speed : 9,600bps
- com length : 1,2km
- com port : RS-485(2wire)
- max node : 1~32

Fault event

- current : 8ch, 16ch, 24ch, 32ch
- data : date, time, circuit

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Specification

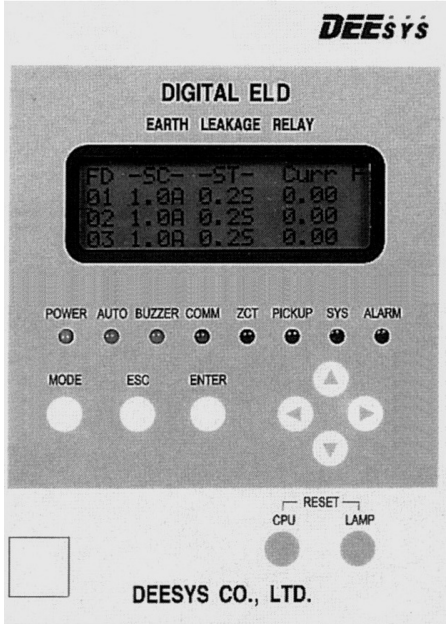
D2K-ED08(8circuit)
D2K-ED24(24circuit)
D2K-ED16(16circuit)
D2K-ED32(32circuit)

Product name	Earth Leakage Detector [ELD]			
Contact	1a(Common)			
	8a	16a	24a	32a
Model	D2K-ED08	D2K-ED16	D2K-ED24	D2K-ED32
Certificate No.	07-13	07-16	07-14	07-10
Monitoring Circuit	8Circuit	16Circuit	24Circuit	32Circuit
Power Source	AC 110/220 ± 15%, 50/60㎐ (Default), DC 110/125 ± 20%			
Rated Current Sensitivity	AC 200mA~1000mA (100mA Step), Default-0.5A			
Time Setting Range/Deviation	0.1~3.0Sec/0.1:±50ms, 0.2~3.0:±15%(0.1sec, Step), Default-0.2Sec			
Operating Current	Between 53% and 75% of resonable value			
Non-Operating Current	Below 52% of reasonable value			
Rated current Z.C.T	200mA / 100mV(75~125mV at 2kΩ Resistance)			
Display	L.C.D(20Char, X 4Line)			
Key Method	MODE,ESC,ENTER,Direction Keys(□,□,□,□)			
LED(Lamp)	POWER(green):Indicating the staus of the internal CPU			
	AUTO(yellow):Resetting of Relay and Lamp[On(Flickering):Auto/Off:Manual]			
	BUZZER(yellow):Indicating whether of not the buzzer would sound when operating [Off(Flickering):No Beep/On:Beep]			
	COMM(yellow):Indicating communication in progress(Flickering)			
	ZCT:Faulty ZCT connection (unused feeder-Z.C.T Common terminal)			
	PICK(red):Detecting leakage current when operating			
	SYS(red):Internal error in the detector(System Error)			
	ALARM(red):Indicating operation caused by an electric leakage			
Fault Memory	10 faults(the latest fault is marked with "1")			
Resetting Method	Auto Reset/Manual Reset(selected with the program)			
Temperature	-10~60℃(in operation), -20~70℃(to be kept)			
Mounting Method	Hideaway Type			
Capacity of contact Point	AC 250A 5A 0.5sec(L/R=0)			
Buzzer	75dB(within 1m)			
Insulation Resistance	1' st-ground / 2' nd-ground / 1' st-2nd : 100㏁ or more DC500V Megger			
Withstand voltage	1' st-ground : AC 1,500V			
	2' nd-ground : AC 500V			
	1' st-2' nd : AC 1,500V			
Lighting impulse Withstand voltage	Aux. power - ground 1.2㎲×50㎲×6㎸ Positive/Negative electronics. 3time			
Vibration	Vibration frequency:16.7㎐ Double amplitude : 0.4㎜ Direction:horizontal, vertical, transverse			
Shock times:3 times	Shock acceleration:50G Shock application direction:horizontal, vertical, transverse Shock			
Weight	2kg	7kg		

Front View

Display →
General Setting
Level Setting point
Fault check
Communication
Self test mode

Key Part →
Top menu modekey
Escape Key menu
Cursor menu key



LED indicator
CPU(RUN)Error check
Auto/Manual Set
Buzzer On/Off Set
Communication con.
ZCT connection check
← Pick-up/system check

← Key part
Up↔Down menu
Right↔Left menu

← Reset
Lamp and CPU reset

Menu Specification

START ON DISPLAY

- After approving power or pressing the CPU RESET button, the LCD will become bright and the screen below will be displayed fer about 5 seconds. Then, you will be automatically taken to Display On/Off Mode or Display Mode.
- Default : Display On Mode

```
                    DEEsys
D2K-ED Series
                    V1.00
```

DISPLAY ON MODE

- If 〈Display ON Mode〉 has been preset, you will be automatically taken to the Display On Mode screen 5 seconds after approving initial supplementary power supply or pressing the CPU RESET

```
Display On Mode
2000 01 01 12:15:36
```

IN CASE OF ELECTRIC LEAKAGE

```
Fault
FD Curr Date Time
03 0.72 0107 17:36
□09 1.63 0107 17:36
```

- In Case that an electric leakage has occurred, the screen below is displayed regardless of Display On/Off Mode.
- The event is saved in Fault Memory(up to 10 events).
- Press the ESC button to move to Display On Mode.

DISPLAY MODE

```
Fd -SC- -ST- Curr F
01 0.25 0.3s 0.20
02 0.12 0.2s 0.10
03 0.47 0.7s 0.72
```

- Fd(Feeder) : Circuit Number
- S C : Set Amount of Leakage Current
- S T : Set Amount of Delay Time for Leakage Alarm
- Curr (Current) : Present Leakage Current
- F (Fault) : Indicating the Occurrence of Electric Leakage (marked with 'X')
- The status of each feeder is displayed by rotation. Press the Up/Down key(↑ , ↓) to quickly move to a desired feeder.

TOP MENU

- Press the MODE button in Display On or Off Mode to view the Top MENU screen below. (If no action is taken by pressing any key within 10 seconds in the TOP MENU screen, it will be converted back to the present Display Mode.

```
T  TOP MENU
1.General Set  *
2.Level Set
□ 3.Fault Check
```

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Sub Menu

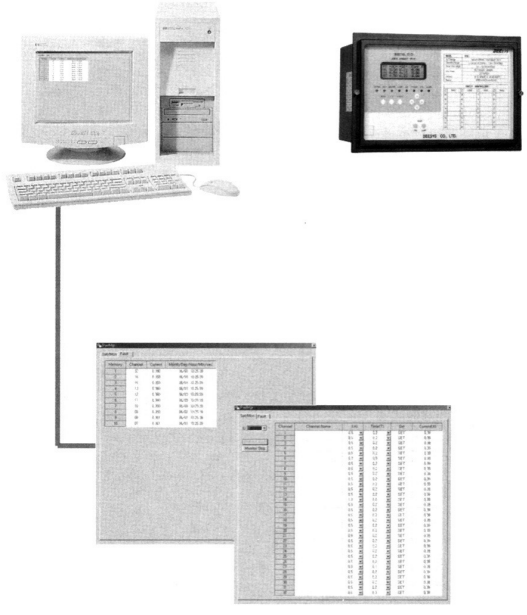
- **General Set**
  Setting Display On/ Off Mode, Setting Buzzer On/ Off,
  Setting Auto/ Manual resetting for contact point,
  Erasing saved events in memory, Setting data and time

- **Level Set**
  Setting operating current and delay time

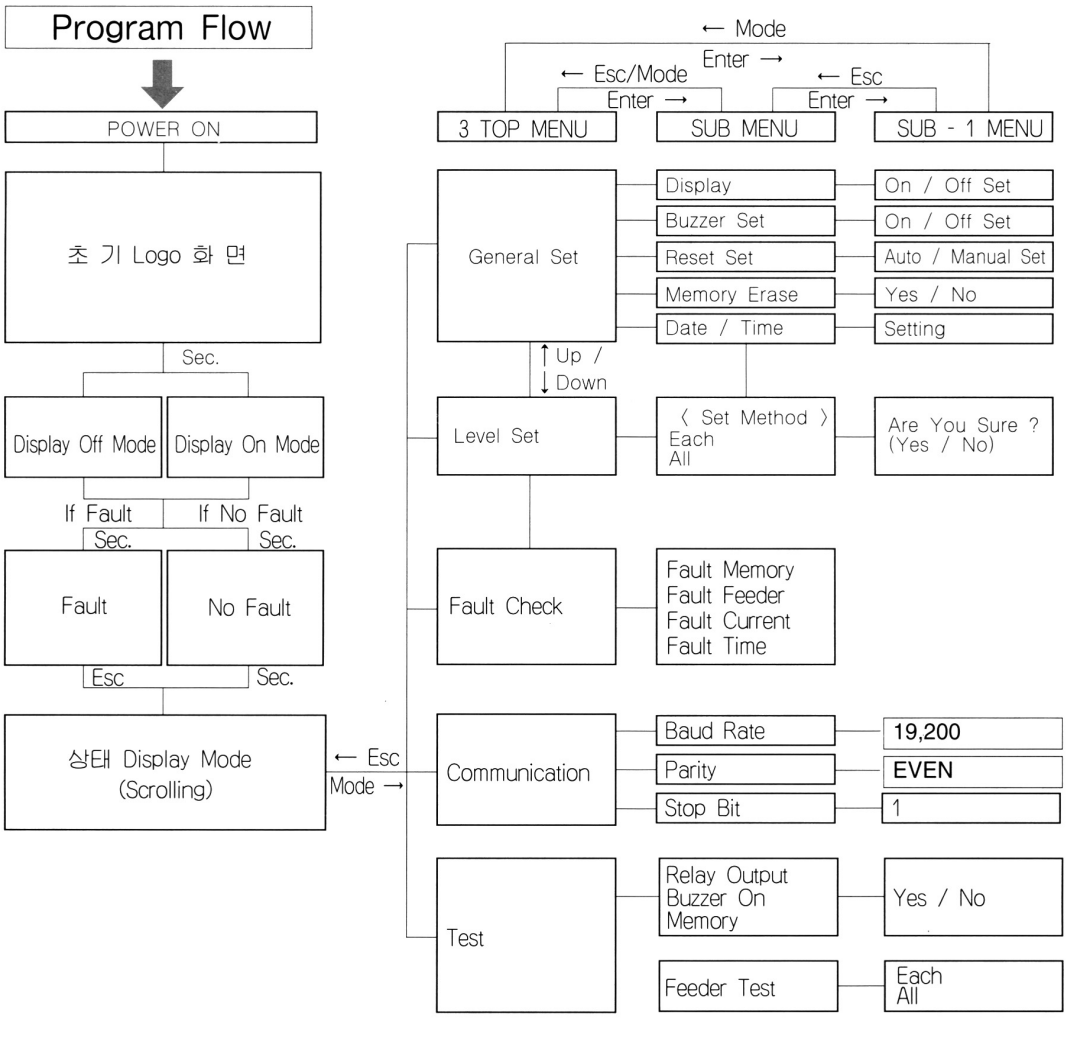
- **Fault Check**
  Checking the history electric leakage occurrence
  (Feeder in which leakage occurred,)
  Leakage current, Time of leakage occurrence))

- **Communication**
  Setting items related to communication

- **Test**
  Setting items related to operation test



System Menu



GENERAL SET

– Place the blinking cursor onto '1. General Set' in the TOP MENU and press the ENTER button. The screen below will be displayed.

```
General Set
1.Display [On]      *
2.Buzzer  [On]
□ 3.Reset Set [Auto]
```

MEMORY ERASE [YES / NO]

– If you press ENTER button from the Memory Erase[Y] screen, the saved fault events will be erased.
– After they are erased, you will be taken back to the previous sub menu screen.

```
Memory Erase   [N]
    YES:UP NO:DOWN
```

SETTING AS "EACH"

```
SET MODE (I/dt)
 01 A[0.5]  Dt[0.2]
 02 A[0.5]  Dt[0.2]
□03 A[0.5]  Dt[0.2]
```

– Enter leakage current for each feeder using the Up/Down key. Move to Dt(Edlay time) by pressing the MODE button and set delay time for each feeder using the Up/Down key.
– When you are finished with one feeder, you can move to the next one by placing the blinker at the end of the feeder and pressing the Left key.
– Repeat the procedure until you finish setting and press the ENTER button. The confirmation message below will appear.

```
SET MODE (I/dt)
 Are You Sure.?(Y)₩
      YES:UP NO:DOW
```

– When the message 'Are You Sure?' appears on the screen, you can apply a new setting by entering Y(YES) and pressing the ENTER button.
– If there is only feeder to modify, change the value of a specific feeder and simply press the ENTER button.
– After new settings are saved. you will be taken to the TOP MENU

SETTING AS "ALL"

```
Current Set   [0.5]A
 Delay Time    [0.2]s
   HI:UP  LOW:DOWN
```

– Select 'ALL' on the screen above and press the ENTER button. The screen below will be displayed. Enter a new value for leakage current and delay time and press the ENTER button.

```
Current Set   [0.5]A
 Delay Time    [0.2]s
Are You Sure.?(Y)
      YES:UP NO:DOWN
```

– When the message 'Are You Sure?' appears on the screen, you can simultaneously apply a new setting to all the feeders by entering Y(YES) and pressing the ENTER button.
– After a new setting is saved, you will be taken back to the TOP MENU

COMMUNICATION

– Place the blinking cursor on '4. COMM SET' and press the ENTER button. the screen below will appear.

```
COMM SET MODE
 1.Port No.      [00]*
 2.Baudrate   [9600]
□3.Parity       [None]
```

PORT NO

```
Comm Port No.  [01]
    ( 1 – 16 )
     HI:UP LOW:DOWN
```

– You can specify a communication port using the Up/Down key.
– After a new port is saved, you will be taken to the previous sub menu screen.

BAUD RATE

– It is fixed to 9600bps.

PARITY

– It is fixed to 'None' type.

STOP BIT

– It is fixed to 1.

TEST

– You must configure as below in order to test the detector manually.

```
TopMenu
 3.Fault Check
 4.Comm Set
□5.Test Set
```

– Place the blinking cursor on '5. Test Set' and press the ENTER button. the screen below will appear.

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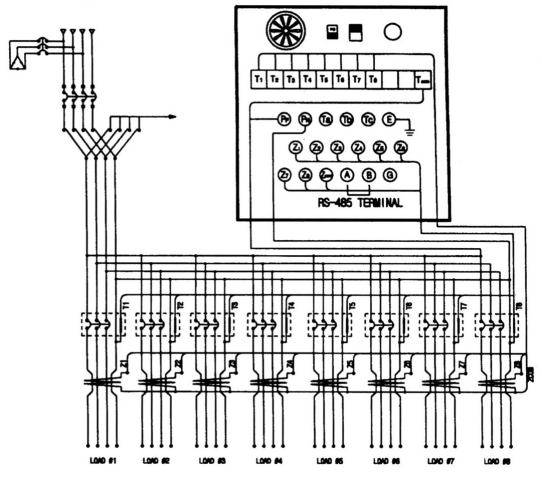
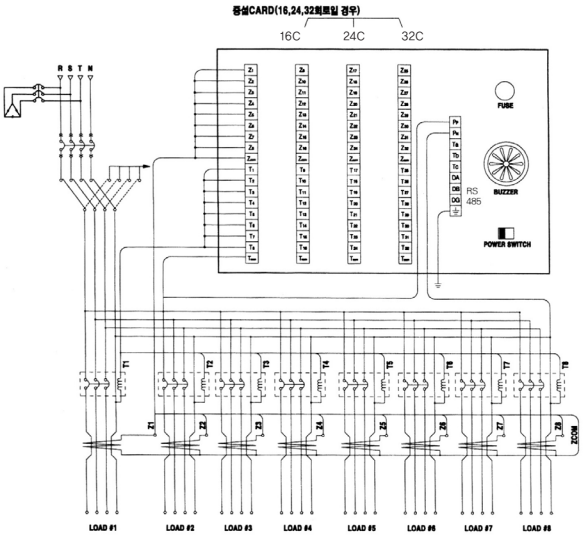
Wiring

- 8C

External Wiring(ED 8 CIRCUIT TYPE)



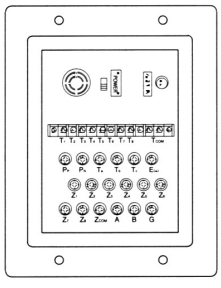
T1~T8 : "a"
Tcom : Common
PP PN : Ac 110/220V(DC110V)Aux, Power
Ta Tb Tc : Alarm
E : (E3)
Z1~Z8 : ZCT
Zcom : ZCT
A B G : (RS-485) DA:(+), DB(-), DG



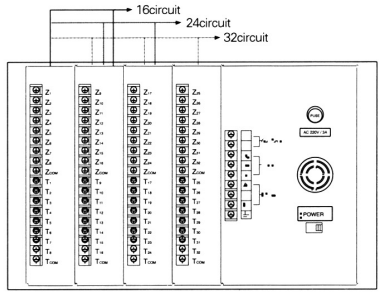
T1~T32 : "a"
Tcom : Common
PP PN : Ac 110/220V(DC110V) Aux, Power
Ta Tb Tc : Alarm
E : (E3)
Z1~Z32 : ZCT
Zcom : ZCT
DA, DB, DG : (RS-485) A(+), B(-), G

Terminal arrangement

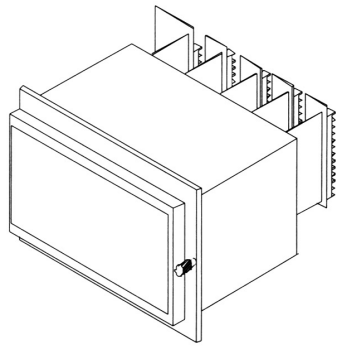
- 8C, 16C, 24C, 32C



〔8circuit〕

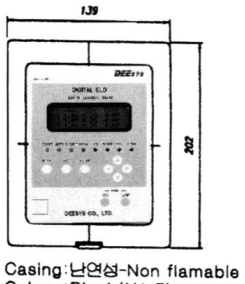


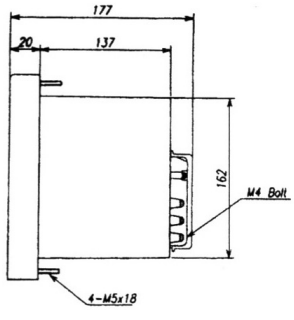
〔16, 24, 32 circuit〕

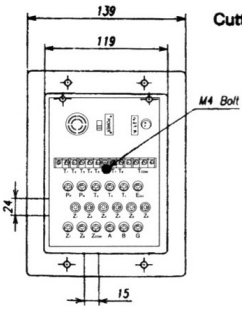


Dimension

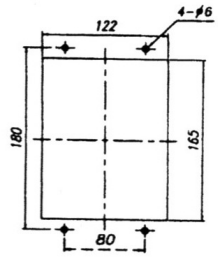
- 8C







Cutting Size : 122 × 165mm



- 16C, 24C, 32C