# DELAB

## User Guide

### Auto-reset type DP-10R
*Digital* Earth Leakage Relay

#### features

True RMS Measurement with SPARC[1] and DCOI[2] Algorithm
Fundamental Signal Detection[3]
Real Time Display of I∆n in mA / A
Fault / lo-set & hi-set Trip LED Indication
Fault Start Event Recording & LED Indication
Trip Event Memory (non-volatile 7 previous records)
Fault Start Event Memory (non-volatile 4 previous records)
Selectable Frequency (50/60 Hz)
Trip Lock-out contact for K2
Last Trip Elapsed Time (up to 99days)
Self Reclosing / Auto-reset
Re-start Interval Setting
Auto Z.C.T. Detection
Software Lock to Prevent Unauthorized Setting
Complies with :
IEC-60255-26/27 ; BS EN 50121-5 Standards
External Plug-in Module for :-
A-01s / A-01sp (RS-485 MODBUS RTU) isolated type

## Panel Overview
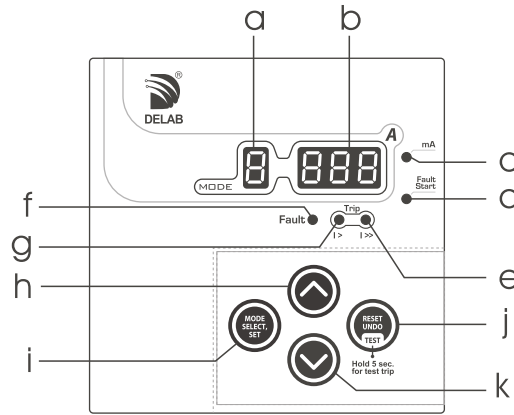


a. Single digit mode LED display
b. 3 digit data LED display
c. (mA) indication
d. Fault start indication
e. Hi-set trip indication
f. Fault indication
g. Lo-set trip indication
h. Up button - increment
i. Mode select / Set button
j. Reset / Undo / Test trip button
k. Down button - decrement

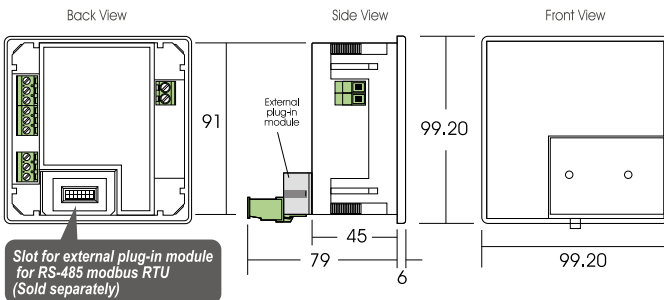## Technical Data

| | | |
|---|---|---|
| Aux Power | : | 65 ~ 275 Vac (45 ~ 65 Hz); 90 ~ 300 Vdc (for model 220a) |
| | : | 18 ~ 72 Vdc (for model 024d) |
| Fundamental Frequency | : | 50 or 60 Hz (software selectable) |
| Current Input (I∆n) | : | ZCT (multiple sizes from ID of 30~300mm) |
| Measurement Range | : | 0.01 ~ 30.0 A |
| Output Relay Rating | : | SPDT 5A, 250V AC/DC |
| Consumption | : | < 3 VA |
| Accuracy | : | Current protection threshold (±5%), Time delayed (+5% or 50ms) |
| Display | : | 7-Segment LED (3 + 1digit) |
| Indication (LEDs) | : | mA, fault start event, Io / hi-set trip, fault |
| Operating Temp. | : | 0°C ~ +55°C |
| Humidity | : | 56 days at 93%RH, 40°C non-condensing |
| IP Rating | : | IP54 (front panel) |
| Weight | : | 230 g |

## Parameter Setting Range

**1  I∆n > (A)** *( lo-set )*  **0.03 ~ 30.0 A**
0.03~1.00 A ( step of 0.01A )
1.00~3.00 A ( step of 0.05A )
3.00~10.0 A ( step of 0.10A )
10.0~30.0 A ( step of 0.50A )

**2  t > (sec)** *(lo-set trip time delay)*  **0.03 ~ 20.0 sec**
0.03~ 0.10 s ( step of 0.01s )
0.10~1.00 s ( step of 0.02s )
1.0 ~20.0 s ( step of 0.1s )

**3  I∆n ≫ (A)** *(hi-set)*  **OFF or 0.10 ~ 30.0 A**
0.10~10.0 A ( step of 0.1A )
10.0~30.0 A ( step of 0.5A )

**t ≫** *(sec) hi-set trip time delay*
**Fixed @ 30ms**

**4  Trip-lockout ⟩**
**1~10 times** ( step of 1 time )

**5  Auto-reset timer** *(sec)*
**3s ~ 200s** (step of 1sec)

**6  Re-start Interval** *(minutes / hour)*
**OFF or**
**5 / 10 / 15 / 30 / 45 mins**
**1~ 8 hrs / 10 / 12, 24 hrs**

## Casing



Back View    Side View    Front View

External plug-in module

91
99.20
45
79
6
99.20

**Slot for external plug-in module for RS-485 modbus RTU (Sold separately)**

### Panel Cut-out
### 92 x 92

92
92

*Note: All measurement in mm.*
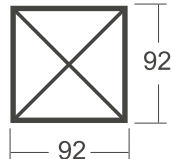
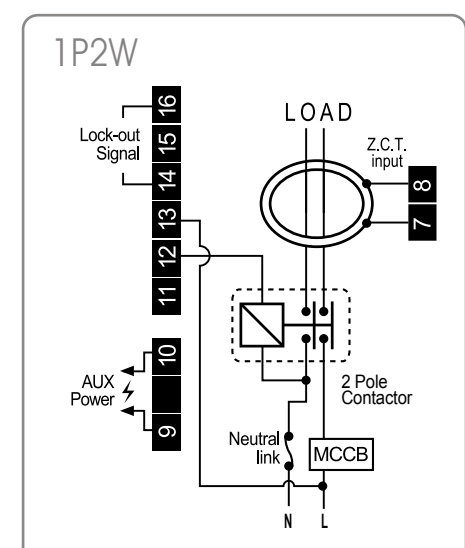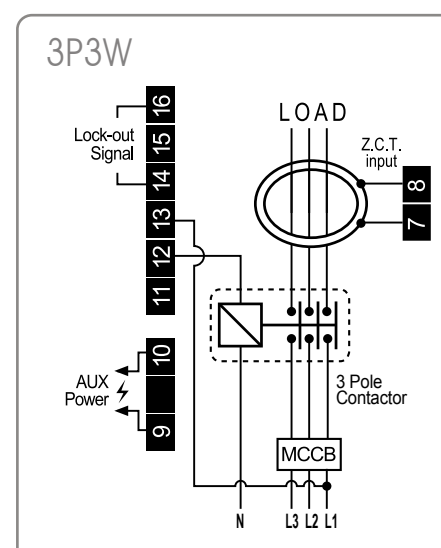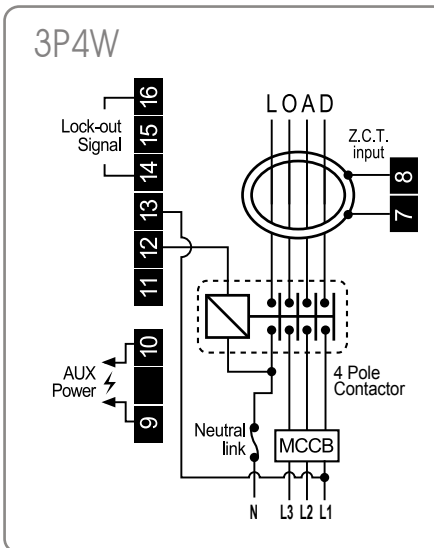Note: Specification subject to change without prior notification (please visit www.delab.com.my for latest specification)

## Wiring

### 3P4W



Lock-out Signal
16 15 14 13 12 11
LOAD
Z.C.T. input
8 7
10 9
AUX Power
4 Pole Contactor
Neutral link
MCCB
N  L3 L2 L1

### 3P3W



Lock-out Signal
16 15 14 13 12 11
LOAD
Z.C.T. input
8 7
10 9
AUX Power
3 Pole Contactor
MCCB
N  L3 L2 L1

### 1P2W



Lock-out Signal
16 15 14 13 12 11
LOAD
Z.C.T. input
8 7
10 9
AUX Power
2 Pole Contactor
Neutral link
MCCB
N  L

# Modes

## Parameters Setting : Mode 1~6

Single digit mode display

Three digit mode display

Mode decimal — Indicates seconds count

### STEP 1
Press [SELECT] button while in default mode (when mode display is blank)

To scroll thru modes, just press & release the Select button

### STEP 2
Press [UP] or [DOWN] button to desired value

For fast increment or decrement, press and hold the Up or Down button

**MODE SELECT, SET**

**RESET UNDO TEST**

### RESET/UNDO
Press button to undo changes or exit mode

### STEP 3
Press [SET] button to store new value & proceed to next mode

### TEST TRIP
Press and hold 5 seconds to test trip device
5 flashes (mode decimal) = 5 seconds

All modes exit automatically if left untouched for more than 20 secs.

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# Info Viewing

## **A Int** Interval trip counter

This mode display the number of tripping that has occurred within the time interval from the 1st tripping. Time interval can be adjusted in mode **6**. The counter will automatically reset to zero once the time interval has been achieved. The counter will also reset automatically when mode **4** is modified.

## **A tot** Total trip counter (max. no = 255)

This mode display the number of tripping that has occurred. The value cannot be reset by any timer. To reset the recorded value, proceed to mode **b** and hold the [RESET] button for 3 seconds.

## **b** , **c1** ~ **c6** Tripped values for last 7 events

Press [SELECT] button until mode **b**.
Display will flash the tripped value for the most recent tripped event.

| Single flash : Indicate a lo-set trip | To reset trip event memory, |
| Double flash : Indicate a high-set trip | hold [RESET] button for 3 sec. in mode **b**. |

Manual tripped event will display a flashing **trP**.
If display shows **---**. (No tripping has occured)
Press [SELECT] button again to scroll thru mode **c1** to **c6**. (Auto skip to mode **d** if memory is empty)
To skip directly to mode **d**, hold [SELECT] button for 1 sec.
To exit, press [UNDO] button.

## **d** View last trip elapsed time

Press [SELECT] button until mode **d**.
Display will show **---** (device has no tripping since last power up).

| e.g. | **00h 23n** hour min Display up to 99 hour 99 min | **00d 23h** day hour Display up to 99 day 99 hour | **oUr 99d** over 99 day |

To exit, press [ UNDO ] button.

## **E1** ~ **E4** Fault start event memory

Press [ SELECT ] button until mode **E1**. If display show **---** (no fault event has occured).
Press [ SELECT ] button again to scroll thru mode **E2** to **E4**. (Auto skip to mode **F** if memory is empty)
To reset memory, hold [ RESET ] button for 3 seconds in mode **E1**.
To exit, press [ UNDO ] button.

## **F UEr** Firmware version

This mode is not adjustable. For user to view firmware version.
Press [ SELECT ] button until mode **F UEr** is being displayed.
The display will show the firmware version of the device.
To exit, press [ UNDO ] button.

## **F oPh** Total operation hour

This mode shows the total time of the device that has been in operation.
Press [ SELECT ] button until mode **F oPh** is being displayed.
Display will show a value (x1000 hr).
To exit, press [ UNDO ] button.

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# Trip Lock-out Conditions

**Loc** is being displayed when there is trip lock-out.
i) Number of interval trip count = Trip lock-out setting
ii) Persistent fault

# Special Setting Modes

When no mode is selected (mode display is blank)

Press 'SELECT & RESET' button simultaneously & hold for 5 seconds until mode **L** appears

**MODE SELECT, SET** **RESET UNDO TEST**

OR — Press 'UP or Down' button to modify parameters

Press 'SET' button to confirm & proceed to next mode

**MODE SELECT, SET**

## **L** Software keypad lock
**OFF** / **On**

## **Fr** Electrical network system frequency
**50** : 50 Hz / **60** : 60 Hz

## **-** Standby option
**OFF** : De-activate / **On** : Activate

After about 3 minutes of idle and no leakage is detected, running LED bar will be displayed instead of the real time leakage current if activated. It automatically exits on leakage detection or Z.C.T. is not connected or when any button is pressed. When device trips, standby mode is temporary de-activated until device is reset. When Z.C.T. is open circuited, standby mode is temporary de-activated until Z.C.T. is connected.
To toggle this setting, user can also press [SELECT] button when powering up the device.

## **CE** Z.C.T. detection
**OFF** : No detection / **Aut** : Auto detection

**ZCt** is being displayed and flashing instead of the real time leakage current when auto Z.C.T. detection is activated, it means that the Z.C.T. is not connected properly. User may need to check the wiring connection with the device.

## **PC** Selection of plug-in module
**A01** : A-01s / A-01sp / **non** : None

## **Ad** Modbus address
Selectable from 1 ~ 247

## **br** Baud rate setting
Set the baud rate in a modbus communication between host computer and device. Selectable as: ( 3 = 300, 6 = 600, 12 = 1200, 24 = 2400, 48 = 4800, 96 = 9600, 192 = 19200 or 288 = 28800 ) bps.

## **Pr** Parity setting
**non** : None / **Odd** : Odd / **EUn** : Even

## **End** End setting
Press [ SELECT ] button to exit and save the setting or [ UNDO ] button to go back

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*Digital* Earth Leakage Relay **DP-10R** (Auto-reset type)