



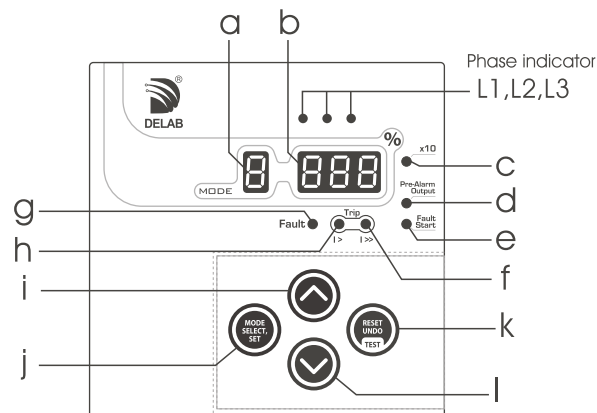
User Guide

DP-23 (DTL) Digital Over Current Relay

features

- True RMS Measurement with SPARC¹ and DCOIP² Algorithm
- Auto / Manual Scroll for Real Time Display of Phase Current in (%)
- LTI + DTL
- Fault / lo-set & hi-set Trip LED Indication
- Fault Start Event Recording & LED Indication + Output³
- Pre-Alarm LED Indication + Output³
- Trip Event Memory (non-volatile 7 previous records for all phases)
- Fault Start Event Memory (non-volatile 4 previous records with phase info)
- Selectable Frequency (50 / 60 Hz)
- Programmable Relay Output Contact for K2
- Last Trip Elapsed Time (up to 99 days)
- Software Lock to Prevent Unauthorized Setting
- Complies with IEC-60255-26/27 ; BS EN 50121-5 Standards
- ANSI Code: 50P, 51P
- 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. x 10
- d. Pre-Alarm output indication
- e. Fault start indication
- f. Hi-set trip indication
- g. Fault indication
- h. Lo-set trip indication
- i. up button / increment
- j. mode select / set button
- k. reset / undo / test trip button
- l. down button / decrement

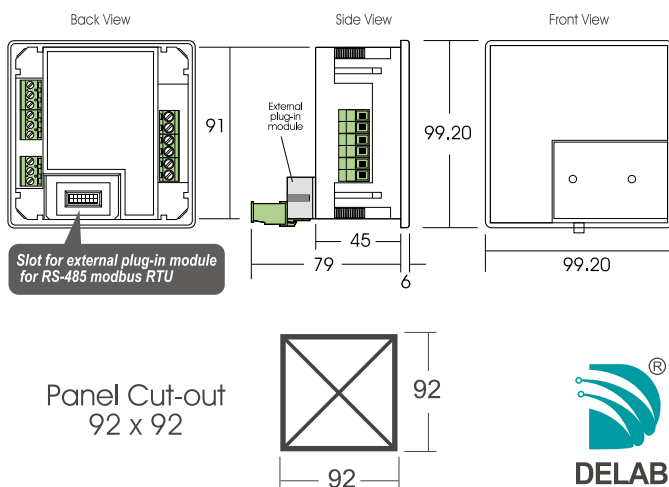
Technical Data

Aux Power	: 65~275 Vac (45~65 Hz) ; 90~300 Vdc or 18~72 Vdc
Current Input (In)	: ..5A or ..1A
Fundamental Frequency	: 50 or 60 Hz (software selectable)
Burden	: <0.3 VA @ In
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 + 1 digit)
Indication (LEDs)	: phase, x10, pre-alarm, fault start event, lo / 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	: 260 g

Parameter Setting Range

$I_p > (\%)$: lo-set trip	2% ~ 200% (step of 1%)
IDMT $I_p >$	LTI + DTL
TMs $I_p >$: Time multiplier for IDMT	0.05 ~ 1.00 (step of 0.01)
$t_p > (\text{sec})$: lo-set trip time delay for DTL	0.03s ~ 20.0s
	0.03s ~ 0.10s (step of 0.01s)
	0.10s ~ 1.00s (step of 0.02s)
	1.0s ~ 20.0s (step of 0.1s)
$I_p >> (\%)$: hi-set trip	OFF or 20% ~ 2000%
	20% ~ 1000% (step of 10%)
	1000% ~ 2000% (step of 100%)
$t_p >> (\text{sec})$: hi-set trip time delay	Instant or 0.02s ~ 0.5s (step of 0.01s)

Casing



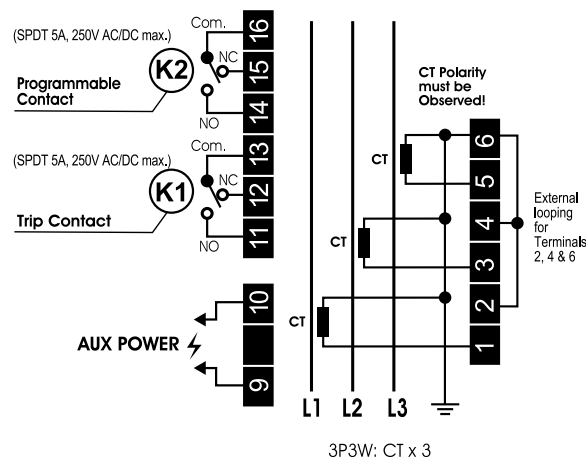
Note: All measurement in mm.

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

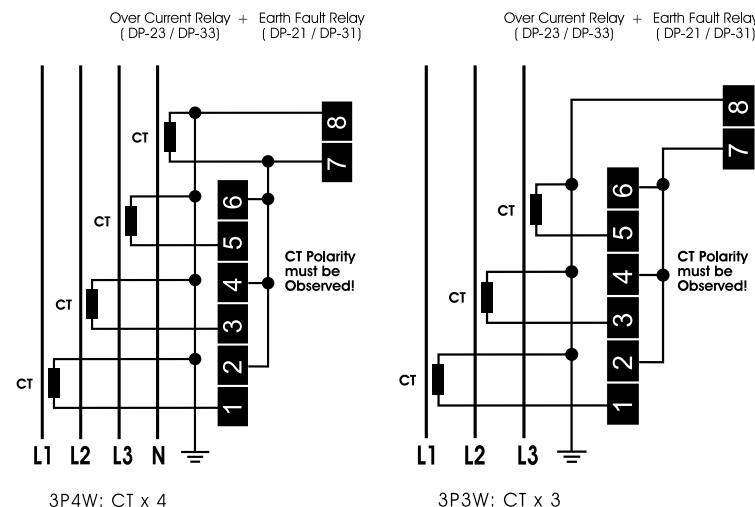


Wiring

When used without Earth Fault Relay



CT connection when used with Earth Fault Relay





Modes



PARAMETER SETTING

1	$I_p > (\%)$	lo-set trip
2	IDMT $I_p >$	LTI + DTL
3	TMs $I_p >$ or $t_p >$ (sec)	Time Multiplier or lo-set trip time delay
4	$I_p >> (\%)$	hi-set trip
5	$t_p >> (\text{sec})$	hi-set trip time delay



VIEWING INFO

6, 01 to 06	Trip memory	7 trip event memories (non-volatile)
7	Last trip elapsed time	Last trip elapsed time
81 to 84	Fault start memory	4 fault start event memories (non-volatile)
F U E r	Version	Firmware version
F o P h	Operation hour	Device operated in hours (x 1000 hr)



SPECIAL SETTING MODE

L	Software lock	Keypad lock : OFF or ON
21	Trip relay K1 response type	Latching (Lc) or Non-latching (nLc)
22	Output relay K2 function	Programmable relay output
23	Trip relay K2 response type	Latching (Lc) or Non-latching (nLc)
F r	Network frequency	Selectable as : 50 Hz or 60 Hz
-	Standby mode	Running LED bar : ON or OFF
PC	Selection of plug-in module	A-01s / A-01sp (RS485 modbus isolated type) or none
8d	Modbus address	Selectable from 1 ~ 247
b r	Baud rate setting	Selectable from 3,6,12,24,48,96,192,288
End	End program setting	Exit special setting mode



Parameters Setting

Single digit mode display



Three digit mode display

Mode decimal
Indicates standby mode / 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

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.



Info Viewing

6, 01 ~ 06

Tripped values for last 7 events

Press [SELECT] button until mode 6 or hold [SELECT] button for 1 sec in any mode 1~5.
Display will show the tripped value for the most recent tripped event.

Single flash : Indicate a lo-set trip
Double flash : Indicate a high-set trip
Manual tripped event will display a flashing E r P.
--- Indicate no tripping has occurred.

Press [SELECT] button again to scroll thru mode 01 to 06. (Auto skip to mode 01 if memory is empty)

Skip directly to mode 01 :
Hold [SELECT] button for 1 second.
Clear trip event memory :
Hold [RESET] button for 3 seconds in mode 6.
Press [UNDO] button to exit.

7 View last trip elapsed time

Press [SELECT] button until mode 7.
Display will show the elapsed time of last trip since last power up.

--- Indicate no tripping since last power up.



Press [UNDO] button to exit.

81 ~ 84

Fault start event memory

Press [SELECT] button until mode 81.
If display shows --- (No fault event has occurred)
Press [SELECT] button again to scroll thru mode 82 to 84. (Auto skip to next mode if no fault start event has occurred)
Clear fault start event memory :
Hold [RESET] button for 3 sec. in mode 81.
Press [UNDO] button to exit.

F U E r Firmware version

Press [SELECT] button until mode F U E r.
Display will show the firmware of the device.
Press [UNDO] button to exit.

F o P h Total operation hour

Press [SELECT] button until mode F o P h.
Display will show a value (x1000 hr).
Press [UNDO] button to exit.

Manual Scroll

Press [UP/DOWN] button when mode display is blank. Display will show the individual phase current (L1,L2,L3) in real time. Continue pressing the [UP/DOWN] button to scroll thru the next phase. Press [UNDO] button to exit.

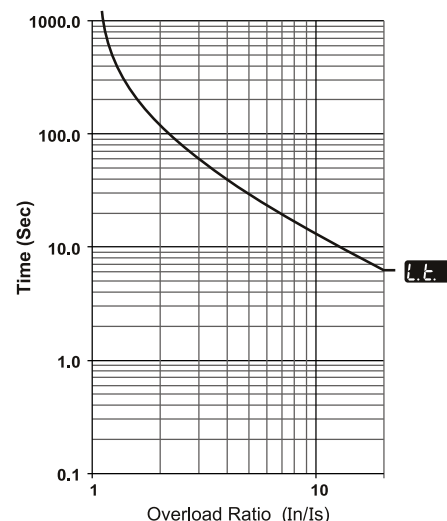


IDMT graph

Time graph based on
Time Multiplier 1.0

Characteristics

L.T.I
Long Time Inverse



Special Setting Modes

When NO mode is selected (mode display is blank),

- Press [SELECT] & [RESET] button simultaneously and hold for 5 seconds until mode L appears.
- Press [Up] or [Down] button to modify
- Press [SET] button to confirm and proceed to next mode

L Software keypad lock

OFF or 0n

22 Trip relay K2 response type

Lc : Latching trip nLc : Non-Latching trip

24 Trip relay K1 response type

Lc : Latching trip nLc : Non-Latching trip

F r Electrical network system frequency

Electrical network frequency setting:
50 : 50 Hz 60 : 60 Hz

22 Output relay K2 function

E r P : Tripping output (Lc / nLc)

- Standby option

OFF : De-activate 0n : Activate

Fault Start Output Function

L F S : Lo-set fault start signal output (Lc / nLc)
H F S : Hi-set fault start signal output (Lc / nLc)
A F S : Any fault start signal output (Lc / nLc)

Fault start event LED (e) indicates any detected fault events.

To clear event indication, press [RESET] button or scroll to mode 81 while no fault is present.
K2 output will be activated when there is any fault start event if programmed is being set as 'AFS'.

To latch fault events output, select 22 to Lc in trip relay K2 response type.

Device Failure Output Function

D U F : Device failure output (nLc only)

K2 automatically turns ON when device is functioning normally.

Circuit Breaker Failure Output Function

C B F : Circuit breaker failure output (nLc only)

Activates K2 output if fault still exists after 100 ms of trip event.

Pre-Alarm Output Function

A90 : >90% of $I_p >$ (Lc / nLc)

A95 : >95% of $I_p >$ (Lc / nLc)

If K2 is programmed to pre-alarm A90 / A95, Pre-alarm output LED (d) will indicate the status of K2. Set 22 to Lc in trip relay K2 response type if need to latch pre-alarm events.

Press [RESET] button to clear output.

PC Selection of plug-in module

A01 : A-01s / A-01sp non : None

8d Modbus address

Selectable from 1~247

b r 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
Data parity is fixed to none.

End End setting

Press [SELECT] button to exit & save the setting or [UNDO] button to go back.