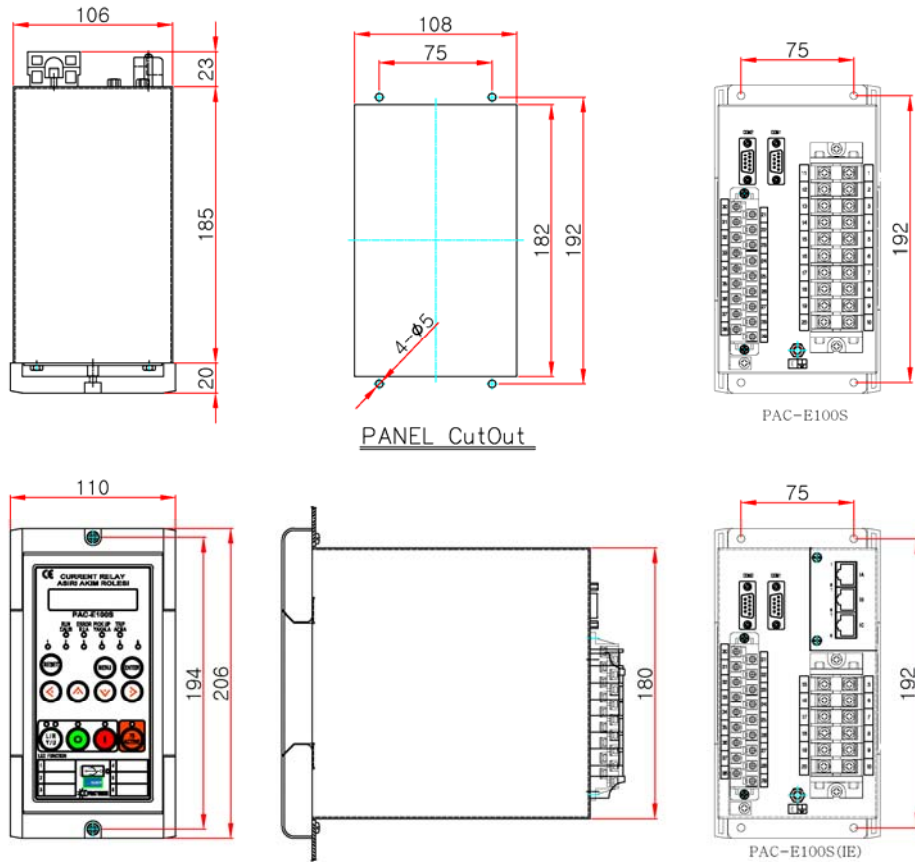


DIMENSIONED DRAWING



**PAC- E100S(IE)
QUICK INSTALLATION AND SETUP GUIDE**









⚠ SAFETY CAUTIONS













- Apply the rated power to the power terminal of the product.
- Do the appropriate connections based on the wiring diagram.
- Do not expose the product to direct sunlight, shock.
- Do not touch the product with wet hands.

PAC-E100S, Overcurrent & Earth Fault Relay is a microprocessor-based numerical protection relay designed for the management and protection of a distribution feeder. If you want to take advantage of all the features, please refer to the user’s manual. This guide is restricted within basic structure and connection information, key operation for menu handling.

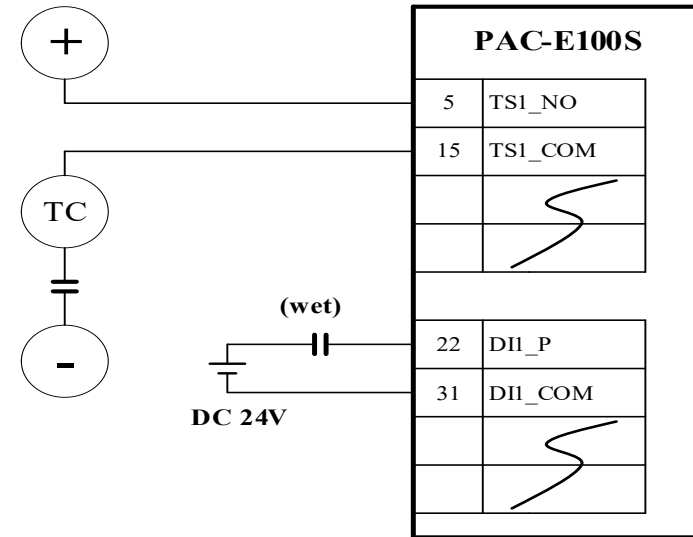
BASIC OPERATION

PAC-E100S overcurrent relay has an extremely easy menu structure.

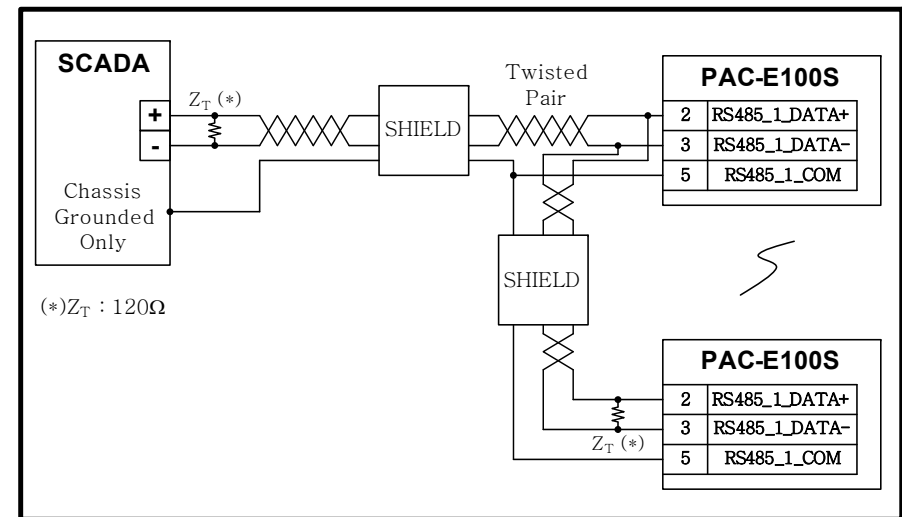
The menu movement is made with four arrow (, , , ) , MENU, ENT Keys. If MENU key is pressed on the top display, then main menus (DISPLAY, SETTING, COMMAND) is blinking and enter the selected menu by pressing ENT key. Within main menu, four arrow(, , , ) keys are used to move the sub-menus.

In SETTING menu, the setting values on PAC-E100S can be viewed without password confirmation and edited after entering password. The item to be changed is selected by pressing , ,  keys and  keys. Press  key, then the value of selected item is blinking. Select the setting value by pressing ,  and enter that by pressing ENT key. In case requesting the password, enter the password correctly through four arrow(, , , ) keys and  key.(Default password are ‘0000’). Repeat above key operation to change multi-items. And for saving, enter ‘YES’ message at “SAVE SETTING CHANGED?” window.

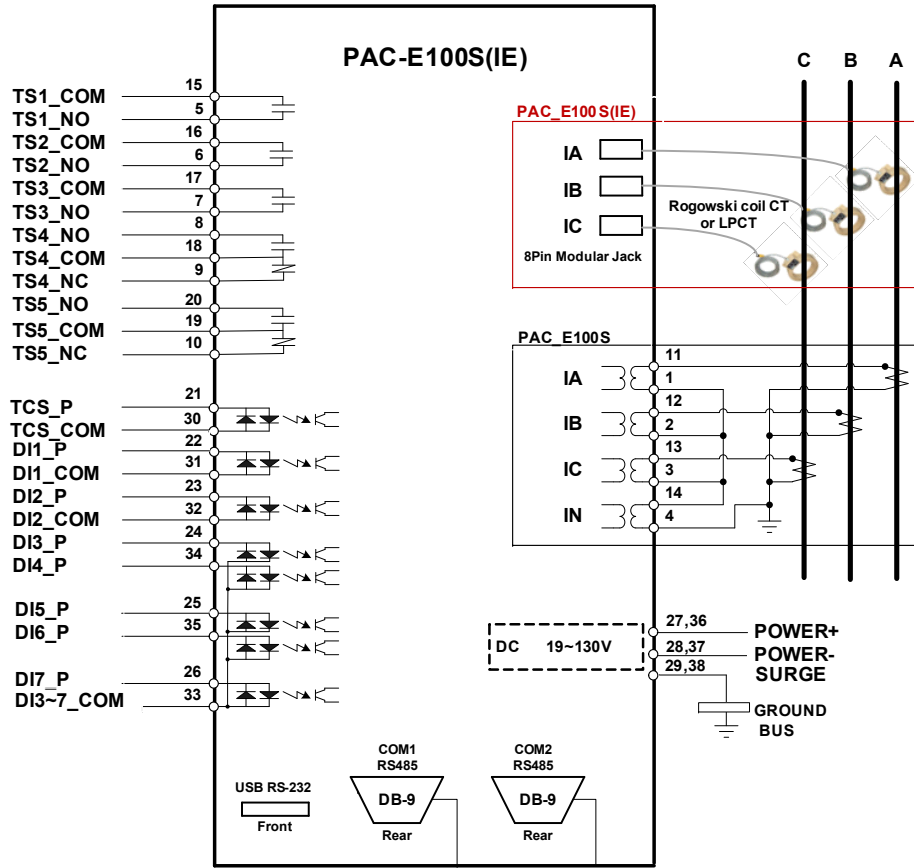
CONTACT INPUT/OUTPUT CONNECTION



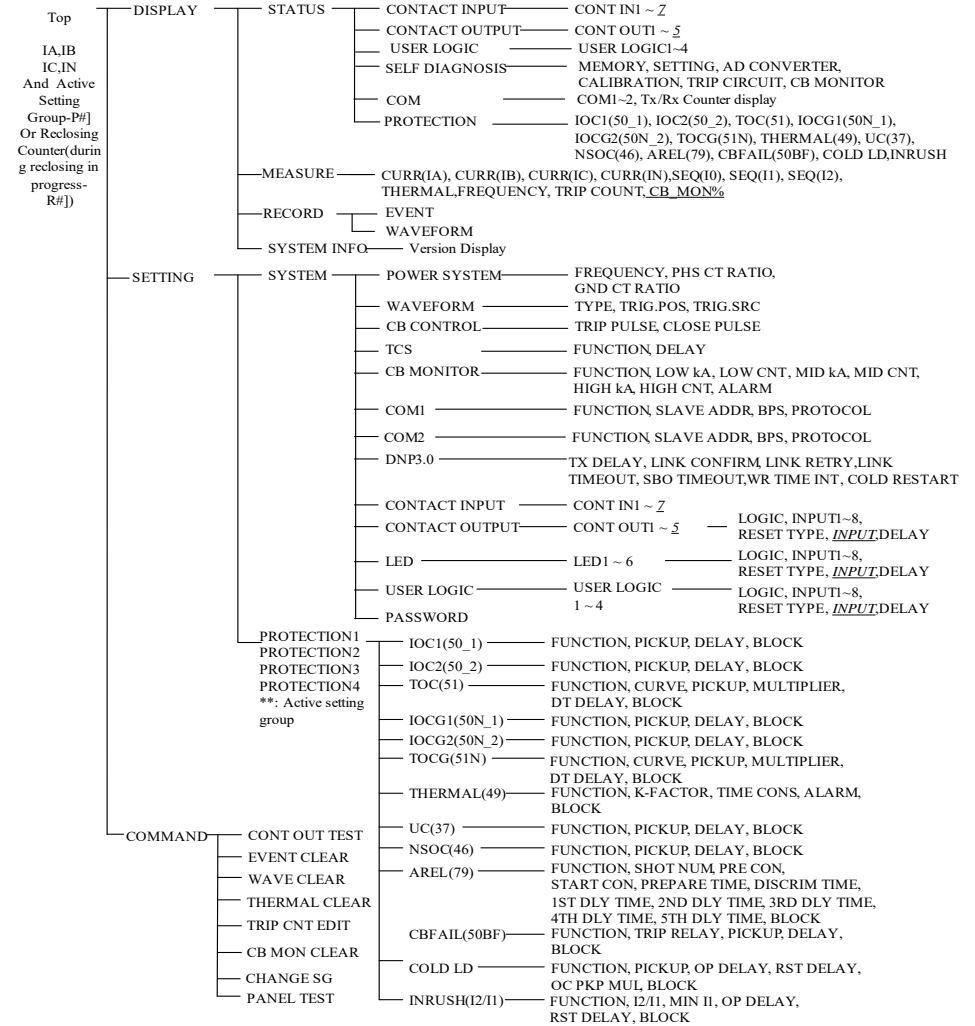
RS-485 CONNECTION(for COM1 or COM2)



TYPICAL WIRING DIAGRAM



MENU TREE



DISPLAY

DISPLAY menu display status of input and output contacts, self diagnosis, protection and logic, the measured values, records of events and waveforms, system information.

COMMAND

COMMAND menu have several useful command such as contact output test, event/waveform record clear, thermal clear, trip counter edit, CB monitoring value clear, setting group change and front panel test.

DISPLAY (ENT)			
↓ STATUS ↔	↓ CONTAC INPUT ↔	↓ CONT IN1~7	OFF / ON
	↓ CONTACT OUTPUT ↔	↓ CONT OUT1~5	DEENERGIZED / ENERGIZED
	↓ USER LOGIC ↔	↓ USER LOGIC1~4	OFF / ON
	↓ SELF DIAGNOSIS ↔	↓ MEMORY	FAIL / OK
		↓ SETTING	FAIL / OK
		↓ AD CONVERTER	FAIL / OK
		↓ CALIBRATION	FAIL / OK
		↓ TRIP CIRCUIT	FAIL / OK
		↓ CB MONITOR	FAIL / OK
	↓ COM ↔	↓ COM1~2	TX/RX counter
	↓ PROTECTION ↔	↓ IOC1(50 1)	Pickup, Operation
		↓ IOC2(50 2)	Pickup, Operation
		↓ TOC(51)	Pickup, Operation
		↓ IOCG1(50N 1)	Pickup, Operation
		↓ IOCG2(50N 2)	Pickup, Operation
		↓ TOCG(51N)	Pickup, Operation
		↓ THERMAL(49)	Alarm, Operation
		↓ UC(37)	Pickup, Operation
		↓ NSOC(46)	Pickup, Operation
		↓ AREL(79)	Ready, In Progress, Fail
↓ CBFAIL(50BF)		Operation	
↓ COLD LD(COLD LD)		Pickup, Operation	
↓ INRUSH(I2/I)		Operation	
↓ MEASURE↔		↓ CURR(IA) ↓ CURR(IB) ↓ CURR(IC) ↓ CURR(IN)	
	↓ SEQ(I0) ↓ SEQ(I1) ↓ SEQ(I2)		Phase sequence current
	↓ 2nd(IA) ↓ 2nd(IB) ↓ 2nd(IC)		2 nd harmonic current

	↓ BLOCK	EasyLogic input
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(*) for 1A rated or E100S(IE), all value should be divided by 5

TERMINAL ARRANGEMENT

PAC-E100S							
No	Description	No	Description	No	Description	No	Description
30	TCS_COM	21	TCS_P	11	IA+	1	IA-
31	DI1_COM	22	DI1_P	12	IB+	2	IB-
32	DI2_COM	23	DI2_P	13	IC+	3	IC-
33	DI3~7_COM	24	DI3_P	14	IN+	4	IN-
34	DI4_P	25	DI5_P	15	TS1_COM	5	TS1_NO
35	DI6_P	26	DI7_P	16	TS2_COM	6	TS2_NO
36	PWR+	27	PWR+	17	TS3_COM	7	TS3_NO
37	PWR-	28	PWR-	18	TS4_COM	8	TS4_NO
38	SURGE	29	SURGE	19	TS5_COM	9	TS4_NC
				20	TS5_NO	10	TS5_NC

*) No1~4, 11~14 are invalid in PAC-E100S(IE) model.

		↑ PICKUP	0.50~100.00A (0.05) (*)		
		↑ MULTIPLIER	0.01 ~ 10.00 (0.01)		
		↑ DELAY	0.00 ~ 300.00s (0.01)		
		↑ BLOCK	EasyLogic input		
↓ THERMAL(49)	↔	↑ FUNCTION	DISABLE / ENABLE		
		↑ K-FACTOR	0.10 ~ 4.00 (0.01)		
		↑ TIME CONST	1.0 ~ 999.9min (0.1)		
		↑ ALARM	50 ~ 100% (1)		
		↑ BLOCK	EasyLogic input		
↓ UC(37)	↔	↑ FUNCTION	DISABLE / ENABLE		
		↑ PICKUP	0.10~5.00A (0.05) (*)		
		↑ DELAY	0.00 ~ 180.00s (0.01)		
		↑ BLOCK	EasyLogic input		
↓ NSOC(46)	↔	↑ FUNCTION	DISABLE / ENABLE		
		↑ PICKUP	0.50~100.00A (0.05) (*)		
		↑ DELAY	0.00 ~ 180.00s (0.01)		
		↑ BLOCK	EasyLogic input		
		↑ FUNCTION	DISABLE / ENABLE		
↓ AREL(79) ↔	↔	↑ SHOT NUM	1~5 (1)		
		↑ PRE CON	EasyLogic input		
		↑ START CON	EasyLogic input		
		↑ PREPARE TIME	0.05~200.00s (0.01)		
		↑ DISCRIM TIME	0.01~5.00s (0.01)		
		↑ RECLAIM TIME	0.01~350.00s (0.01)		
		↑ 1 st ~ 5 th DLY TIME	0.01~300.00s (0.01)		
		↑ BLOCK	EasyLogic input		
		↓ CB FAIL(50BF)	↔	↑ FUNCTION	DISABLE / ENABLE
				↑ TRIP RELAY	TS1, TS2, TS3, TS4
				↑ PICKUP	0.50~5.00A (0.05)(*)
				↑ DELAY	0.00 ~ 60.00s (0.01)
				↑ BLOCK	EasyLogic input
↓ COLD LD(COLD_LD)↔	↔	↑ FUNCTION	DISABLE / ENABLE		
		↑ PICKUP	0.50~2.50A (0.05)(*)		
		↑ OP DELAY	0~18000 s (1)		
		↑ RST DELAY	0~18000 s (1)		
		↑ OC PKP MUL	1.00~10.00 (0.01)		
		↑ BLOCK	EasyLogic input		
↑ INRUSH(I2/I1)	↔	↑ FUNCTION	DISABLE / ENABLE		
		↑ I2/I1	10~100% (1)		
		↑ MIN I1	0.50~2.50A (0.05)(*)		
		↑ OP DELAY	0.00~60.00s (1)		
		↑ RST DELAY	0.00~60.00s (1)		

	↓ THERMAL	Thermal accumulation
	↓ FREQUENCY	
	↓ TRIP COUNTER	
	↓ CB MON%A ↓ CB MON%B ↓ CB MON%C	3 phase CB monitor accumulation %value
↓ RECORD ↔	↓ EVENT	Event list
	↓ WAVEFORM	Waveform list
↓ SYSTEM INFO. ↔	Firmware Version	
COMMAND (ENT)		
↓ CONT OUT TEST ↔	↓ CONT OUT1~5 ↔	↓ DEENERGIZED / ENERGIZED
↓ EVENT CLEAR	→	
↓ WAVE CLEAR	→	
↓ THERMAL CLEAR	→	
↓ TRIP CNT EDIT	→	↑ 0~65535
↓ CB MON CLEAR	→	
↓ CHANGE SG	→	↓ PROT1~PROT4
↓ PANEL TEST	→	

SETTING

SETTING menu have system and protection sub-menu. There are several system setting items such as power system, waveform, RTC, CB control, TCS, CB monitor, COM, contact input , contact output, LED, user logic and password and protection items such as IOC1(50_1), IOC2(50_2), TOC(51), IOCG1 (50N_1), IOCG2 (50N_2), TOCG (51N), THERMAL (49), UC(37), NSOC(46), AREL(79), CBF(50BF), COLD LD and INRUSH

SETTING(SYSTEM)

SETTING (ENT)	Function	Range (Step)
↓ SYSTEM ↔	↓ POWER SYSTEM ↔	↓ FREQUENCY 50/60 Hz
		↓ PHS CT RATIO E100S : 5~6000 : 5 (*)
		↓ GND CT RATIO E100S(IE) : 25~1600:22.5mV
		↓ TRIP RELAY CONT OUT1~4
	↓ WAVEFORM ↔	↓ TYPE 16*50/ 8*100/ 4*200
		↓ TRIG SRC EasyLogic input
		↓ TRIG POS 0~99%(1)

↓ CB CONTROL ↔	↓ TRIP PULSE	0.1 ~ 5.0s (0.1)
	↓ CLOSE PULSE	0.1 ~ 5.0s (0.1)
↓ TCS ↔	↓ FUNCTION	DISALBE / ENABLE
	↓ DELAY	0.00 ~ 300.00s (0.01)
↓ CB MONITOR ↔	↓ FUNCTION	DISALBE / ENABLE
	↓ LOW kA	0.00~650.00 kA(0.01)
	↓ LOW CNT	0~65000 (1)
	↓ MID kA	0.00~650.00 kA(0.01)
	↓ MID CNT	0~65000 (1)
	↓ HIGH kA	0.00~650.00 kA(0.01)
	↓ HIGH CNT	0~65000 (1)
	↓ ALARM	0.0~100.0%(0.1)
↓ COM1~2 ↔	↓ FUNCTION	DISALBE / ENABLE
	↓ SLAVE ADDR	1 ~ 65534 (1)
	↓ BPS	300 / 1200 / 2400 / 4800 / 9600 / 19200 / 38400/ 57600
↓ DNP3.0 ↔	↓ TX DELAY	0 ~ 65000 (1)
	↓ LINK CONFIRM	NEVER / ALWAYS / SOMETIMES
	↓ LINK RETRY	0 ~ 5 (1)
	↓ LINK TIMEOUT	1 ~ 65000 (1)
	↓ SBO TIMEOUT	1 ~ 65000 (1)
	↓ WR TIME INT	0 ~ 65000 (1)
	↓ COLD RESTART	DISABLE / ENABLE
↓ CONTACT INPUT ↔	↓ CONT IN1~7	GENERAL_INPUT / CB_OPENED / CB_CLOSED / ANNUN_RESET / SG_SEL0 / SG_SEL1
	↓ LOGIC	OR8 / HALF_OR8 / AND8 / HALF_AND8
↓ CONTACT OUTPUT / CONT OUT1~5 ↔	↓ INPUT1	<i>EasyLogic input</i>
	↓ INPUT2	<i>EasyLogic input</i>
↓ LED / LED1~6 ↔	↓ INPUT3	<i>EasyLogic input</i>
	↓ INPUT4	<i>EasyLogic input</i>
↓ USER LOGIC / USER LOGIC1~6 ↔	↓ INPUT5	<i>EasyLogic input</i>
	↓ INPUT6	<i>EasyLogic input</i>
	↓ INPUT7	<i>EasyLogic input</i>
	↓ INPUT8	<i>EasyLogic input</i>
	↓ RESET TYPE	SELF / MANUAL
	↓ RESET INPUT	<i>EasyLogic input</i>

	↓ RESET DELAY	0.00 ~ 60.00s (0.01)
	↓ PASSWORD ↔	NEW PASSWORD : **** 0~9, 0~9, 0~9, 0~9

(*) for 1A rated, all value should be divided by 5

SETTING(PROTECTION)

SETTING (ENT)		Function	Range/Step
↓ PROTECTION 1~4 ↔	↓ IOC1(50_1) ↔	↓ FUNCTION	DISABLE / ENABLE
		↓ PICKUP	0.50~100.00A (0.05) (*)
		↓ DELAY	0.00 ~ 300.00s (0.01)
		↓ BLOCK	NO / YES
** : denote active setting group	↓ IOC2(50_2) ↔	↓ FUNCTION	DISABLE / ENABLE
		↓ PICKUP	0.50~100.00A (0.05) (*)
		↓ DELAY	0.00 ~ 300.00s (0.01)
		↓ BLOCK	<i>EasyLogic input</i>
↓ TOC(51) ↔	↓ TOC(51) ↔	↓ FUNCTION	DISABLE / ENABLE
		↓ CURVE	IEC_NI / IEC_VI / IEC_EI / IEC_LI / ANSI_I / ANSI_SI / ANSI_LI / ANSI_MI / ANSI_VI / ANSI_EI / ANSI_DI / KNI / KVI
		↓ PICKUP	0.50~100.00A (0.05) (*)
		↓ MULTIPLIER	0.01 ~ 10.00 (0.01)
		↓ DELAY	0.00 ~ 300.00s (0.01)
		↓ BLOCK	<i>EasyLogic input</i>
↓ IOCG1(50N_1) ↔	↓ IOCG1(50N_1) ↔	↓ FUNCTION	DISABLE / ENABLE
		↓ PICKUP	0.50~100.00A (0.05) (*)
		↓ DELAY	0.00 ~ 300.00s (0.01)
↓ IOCG2(50N_2) ↔	↓ IOCG2(50N_2) ↔	↓ FUNCTION	DISABLE / ENABLE
		↓ PICKUP	0.50~100.00A (0.05) (*)
		↓ DELAY	0.00 ~ 300.00s (0.01)
↓ TOCG(51N) ↔	↓ TOCG(51N) ↔	↓ FUNCTION	DISABLE / ENABLE
		↓ CURVE	IEC_NI / IEC_VI / IEC_EI / IEC_LI / ANSI_I / ANSI_SI / ANSI_LI / ANSI_MI / ANSI_VI / ANSI_EI / ANSI_DI / KNI / KVI