PRODUCT CATALOG

ELECTRONIC DC INPUT METER

TLC-110/ TLC-110L

ELECTRONIC DC INPUT METER

TLC-110/ TLC-110L

OUTLINE

* Simultaneous monitor for voltage, current and power of DC circuit by 1 unit is possible.
* Centralized monitoring in line with system is possible by adding analog output or communication output.

TLC-110/ 110L
110*110*105mm (520g)

FEATURES

* Simultaneous measuring of DC input 3 circuits is possible by 1 unit.
* Power: automatic calculation from DC voltage and current.
* Insulation: 2000V between input, AC2000V between input and output
* With attach scaling function, can set full scale to be any measuring value.
* Simultaneous display by bar graph 1 measuring and digital display 3 measuring is possible.
* Communication output or analog output (up to 3 circuits) can be extracted.
* Measuring display of max. value and min. value can be hold.

TYPE AND SPECIFICATION CODE

Specification Code

Type	—	A	(3)	(4)	(5)	(6)	(7)	—	(8)	0	0

Type
TLC-110 No backlight
TLC-110L With backlight

(3) Input 1		(4) Input 2		(5) Input 3	
0	No Input	0	No Input	0	No Input
1	DC0 - 50mV	1	DC0 - 50mV	1	DC0 - 50mV
2	DC0 - 60mV	2	DC0 - 60mV	2	DC0 - 60mV
3	DC0 - 100mV	3	DC0 - 100mV	3	DC0 - 100mV
4	DC0 - 50V	4	DC0 - 50V	4	DC0 - 50V
5	DC0 - 75V	5	DC0 - 75V	5	DC0 - 75V
6	DC0 - 100V	6	DC0 - 100V	6	DC0 - 100V
7	DC0 - 150V	7	DC0 - 150V	7	DC0 - 150V
8	DC0 - 200V	8	DC0 - 200V	8	DC0 - 200V
9	DC0 - 1mA	9	DC0 - 1mA	9	DC0 - 1mA
Z	Except above *(2)	Z	Except above *(2)	Z	Except above *(2)
DC Power Measurement Specification					
1	DC0 - 50mV	4	DC0 - 50V	W	DC power measurement *(1)
2	DC0 - 60mV	5	DC0 - 75V		
3	DC0 - 100mV	6	DC0 - 100V		
		7	DC0 - 150V		
		8	DC0 - 200V		
Z	Except above *(2)	Z	Except above *(2)		

(6) Auxiliary power		(7) External operation input	
1	For AC85 - 253V and DC80 - 143V Both use	0	None
2	DC20 - 56V	2	Reset
Z	Except above		

(8) Analog / Communication output	
0	No analog / Communication
1	4 - 20mA
2	0 - 1mA
3	1 - 5V
4	0 - 5V
5	0 - 10V
A	Protocol A communication output
Z	Except above *(3)

About the input circuit selection:

* For the input 1 circuit : Input 1
* For the input 2 circuit : Input 1 & Input 2

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Note for Page 2 < Type and Specification Code> :

* (1) When DC power measurement specification is selected, please select the input 1 from code 1-3 and input 2 from code 4-8.
Please specify code Z, in case of input 1 and 2 is ± input.
* (2) a. Input range standard manufacturing range :
1).Voltage Input: ± 50mV - ± 600V
2). Current Input: ± 500μA - ± 50mA
b. Special Input Range:
1). Voltage Input: ± 601V - ± 800V,
2). Current Input: In case of ±100μA - ± 499μA (digital display allowance will change from ± 1.0% to ±1.5%).
c. When voltage input is ± 301V or more: Series resistor DM-1(accessory) is installed to 1mA meter externally.
d. When current input exceeds ± 50mA: Select rated value in line with shunt (sell separately) for use.
(Example: Select code 2 in case of shunt DS50A/ 60mV.)
* (3) a. Analog output standard manufacturing range:
1). Voltage output: ±100mV - ±10V
2). Current output : ±500μA - ±20mA, -10mA
3). No. of output circuit is identical with no. of input circuit.
b. Special analog output:
1). In case that rated value is not identical.
2). In case that current output is ±100μA - ±499μA (Analog output allowance will change from ±0.5% to ±1.0%)

Equipment Specification

Connecting system	Input, auxiliary power part M4 screw
	Reset input, output M3 screw
LCD Display	Main monitor: Character height 10mm 4 digits
	Sub monitor (L): Character height 6mm 4 digits
	Sub monitor (R): Character height 6mm 4 digits
	Bar graph: 30 dots
Display update time	Approx. 1 sec. (Bar graph: Approx. 0.25sec.)
Measurement	DC input 3 circuits, DC power (Operation)
Operating temperature/ humidity range	-10 to +55°C, 30-85% RH (No condensation)
Storage temperature range	-25 to +70°C
Material	ABS (V-0) Exterior color: Black (Munsell N1.5)
Mass	520g
Size	Refer to outline drawing (Compatible with wide angle indicator)

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Auxiliary Power Specification

Power consumption (With backlight)	AC85 - 253V 50/60Hz	12VA
	DC80 - 143V	6W
	DC20 - 56V	7W
Power consumption (No backlight)	AC85 - 253V 50/60Hz	10VA
	DC80 - 143V	5W
	DC20 - 56V	6W
Rush current (For backlight & No backlight both use)	AC110V	5.2A (Approx. 1.7ms)
	AC220V	10.4A (Approx. 1.7ms)
	DC110V	3.7A (Approx. 1.7ms)
	DC24V	5.5A (Approx. 3.6ms)
	DC48V	10.9A (Approx. 3.6ms)

Input Specification

Input	DC0 - 50mV		Approx. 1MΩ
	DC0 - 60mV		
	DC0 - 100mV		
	DC0 - 50V		
	DC0 - 75V		
	DC0 - 100V		
	DC0 - 150V		
	DC0 - 200V		
	DC0 - 1mA		Approx. 1kΩ
100μ - 499μ input: Allowance and temperature characteristics are different from standard.			
Reset input (max./ min. value)	Input Specification	Indication reshuffling input: Indication reshuffling is possible by adding a voltage signal, function same as a DISPLAY switch. Reset input: Reset of the max. value, min. value and warning output is possible by adding a voltage signal. Rating same as the auxiliar power , impress smallest pulse width 300ms continuation.	
	Power Consumption	AC, DC100/110V	0.4VA, 0.4W
		AC200V/220V	1.4VA
		DC24V	0.3W
		DC48V	1.2W
	Contact Capacity	AC, DC100/110V	3mA
		AC200V/220V	6mA
		DC24V	10mA
		DC48V	20mA

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Output Specification

Analog output: 3 circuits	
Rated value	4-20mA: 550Ω or less, 0-1mA: 10kΩ or less 1-5V: 600Ω or more, 0-5V: 600Ω or more 0-10V: 2kΩ or more Specify identical value for each circuit. Non-insulation (minus common) between analog outputs.
Response time	1 sec. or less. Time to be within ±1 % of final constant value
Output ripple	Under 1% p-p against output span
Communication output	
Communication system	RS-485 Half-duplex 2-wire system Asynchronous communication
Transmission speed	1200 / 2400 / 4800 / 9600 bps
Transmission code	NRZ
Start bit	1 bit
Data bits	7/8 bits
Parity	None / even / odd
Stop bit	1/2 bit
Cable length	1000m (Fully extended)
Address	1 - 254
No. of connectable units	Connectable up to 31 units. Use repeater after 32nd unit (Connectable up to 254 units)
Transmission character	ASCII code

PERFORMANCE

Item		Measuring range / Display specification	Allowance		Note
			Display	Output	
Approved standard		JIS C 1102 -1, 2, 7, 8, 9 : 1997 JIS C 1111 - 1989, JIS C 1010-1 : 1998, EIA RS-485 : 1983			
Digital display	Display range	-9999 to 9999	± 1.0%	± 0.5%	Any setting of no. of digits and decimal point location is possible.
Bar graph display	Max. scale	Interger number 10-times (10^n) of : 1, 1.2, 1.5, 1.6, 1.8, 2, 2.4, 2.5, 3, 3.2, 3.6, 4, 4.5, 4.8, 5, 6, 6.4, 7.2, 7.5, 8, 9, 9.6	± 5.0%	-	% against span Note: -9900 ≦ N ≦ 9900
Temperature influence		23°C ± 10°C within allowance			
Display update time		Approx. 1 sec. (Bar graph: Approx. 0.25 sec.)			
Display setting potential element	Main monitor	Measuring element of input1 - input3 (At power measuring specification: measuring element of A/ V/ W).			
	Sub-monitor (L)	Measuring element of input1 - input3 (At power measuring specification: measuring element of A/ V/ W).			
	Sub-monitor (R)	Measuring element of input1 - input3 (At power measuring specification: measuring element of A/ V/ W).			
	Bar graph	Measuring element of input1 - input3 (At power measuring specification: measuring element of A/V/W).			
Power failure guarantee		Max. value, min. value, setting value			

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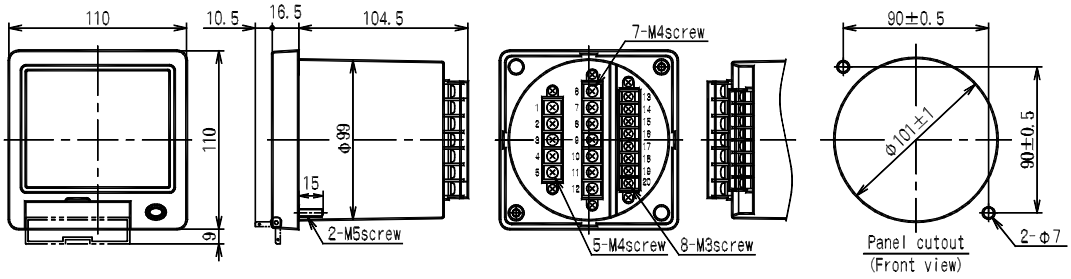
UNIT DISPLAY

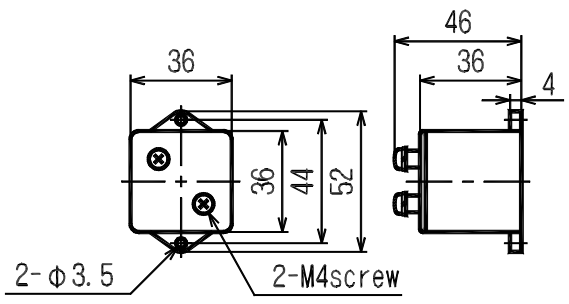
LCD Display (18 types)			Unit Lettring Display (55 Types) *(5)							
	Main Monitor	Sub-monitor								
1	A	A	1	Apm	19	L/h	37	Nm^3/min	55	°C
2	kA	kA	2	bar	20	L/min	38	N/m^2		
3	V	V	3	cm	21	mA	39	N/mm^2		
4	kV	kV	4	cos Φ	22	mg/L	40	OPm		
5	W	—	5	ELm	23	min^{-1}	41	Pa		
6	kW	—	6	Hz	24	mL/min	42	pH		
7	MW	—	7	J	25	mm	43	ppm		
8	°C	°C	8	K	26	m/h *(4)	44	R		
9	%	%	9	kg	27	m/min *(4)	45	rad		
10	m	m	10	kg/h	28	m/s	46	rpm		
11	m^3	m^3	11	kg/m^2	29	mV	47	SPm		
12	m^3/h	m^3/h	12	kg/m^3	30	m^3/s	48	t		
13	m^3/min	—	13	kL	31	Mpa	49	t/h		
14	m/h	—	14	kN	32	Mvar	50	TPm		
15	m/min	m/min	15	kPa	33	MW *(4)	51	W *(7)		
16	r/min	r/min	16	kvar	34	N	52	YPm		
17	min	min	17	kW *(4)	35	N•m	53	µm		
18	no unit	no unit	18	L	36	Nm^3/h	54	µS/cm		

Note *(3): Sub-monitor: Lettering display is possible. Main monitor: LCD display.
Note *(4): Character height of lettering: Main monitor is 8.5mm; sub-monitor is 5mm. Character color: gray (DIC 13th 541)

Outline Drawing (unit: mm)

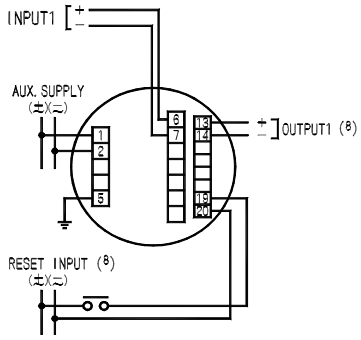


DM-1 Outline drawing

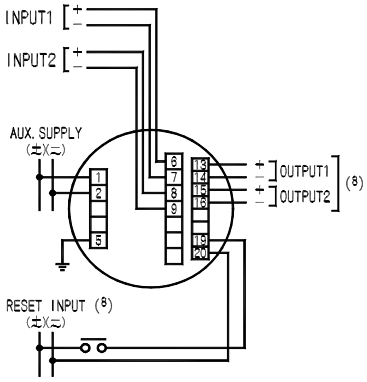


Connection Diagram

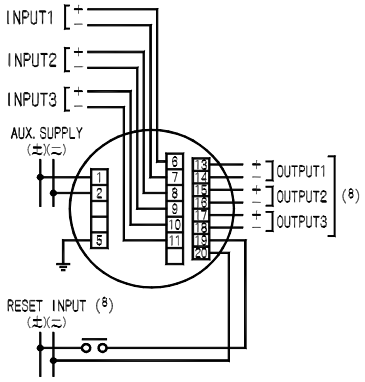
Input 1 circuit



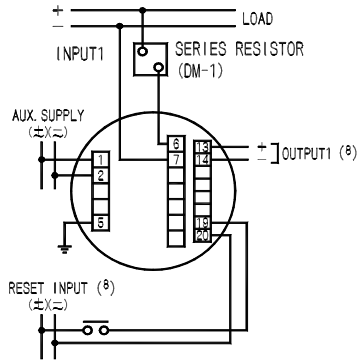
Input 2 circuits



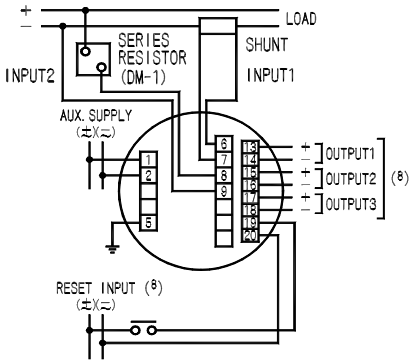
Input 3 circuits



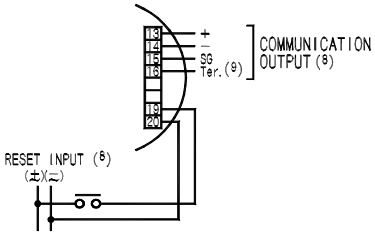
with external series resistor



with external series resistor, shunt



Communication output



Note:

*(8) Output 1, output 2, output 3, communication output, reset input all is option

*(9) Terminating resistance can be connected internally by short circuit between No.14 and No.16.

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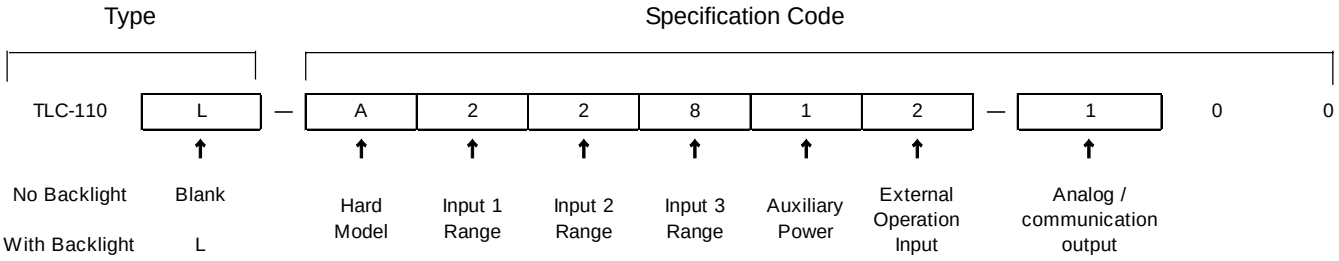
ITEM TO SPECIFY WHEN PURCHASE

*** Specify for Product Type, Specification, Display Scaling and Units require.**

1) Please specify it from the display pattern1 to 6 on page 13 when the electric power measurement is not specified.

* Example of specification Refer to page 2 for specification code.

Display scaling specification (ex.)
Input 1 : 500.0A
Input 2 : 750.0A
Input 3 : 200.0V



2) When specify the electric power measurement, please specify as below :

Input 1: current measurement code;

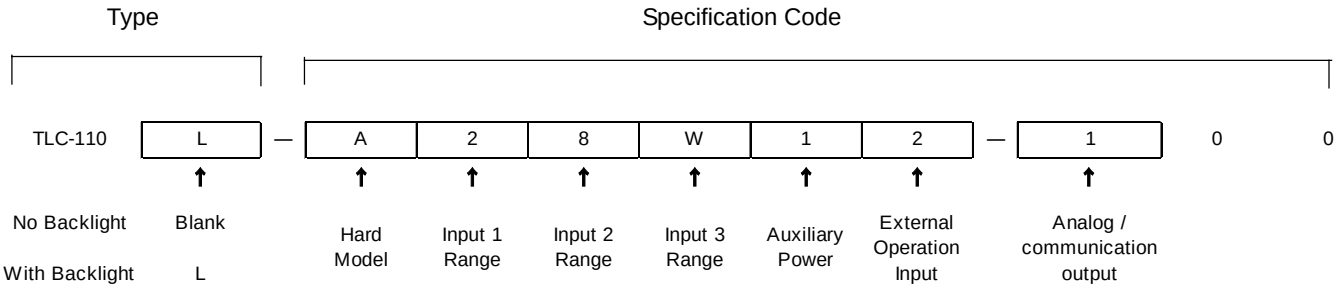
Input 2 : voltage measurement code;

Input 3 : " W " code .

Specify it from the display pattern7 to C on page 13.

* Example of specification Refer to page 1 for specification code.

Display scaling specification (ex.)
Input 1 : 100.0A
Input 2 : 200.0V
Electric power measurement : 20.00kW



* When the display scaling is not specified, display will ship it by the initialization value: "0.0 to 100.0".

* Change initial setting can be accepted with compensation. Specify the items to change. Refer to page 14 for initialization value.

* Have a consultation with us for specification which is not in specification code.

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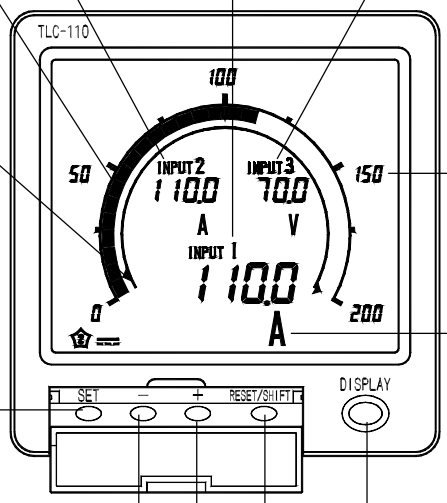
NAME AND THE FUNCTION OF EACH PART



Digital Display
Three elements can be measured and conitored concurrently.

Sub-monitor (L) (Input 2) | **Main monitor (Input 1)** | **Sub-monitor (R) (Input 3)**

Bar Graph Display
Measurement values is indicates by analog. Can be swicth over the measuring element displayed to bar graph display by DISPLAY switch.

Flicker Setting Index
Can use flicker OFF setting to management index.

Scale Numbering
Display scaling setting is sets automamatically.

Unit Display
Unit indication setting, it can set the unit.

SET
This switch is used to select the setting mode. Display mode will be change to setting mode 1 when continuously press ON more then 3 sec. This switch is used to set value in setting mode.

-
This switch is used to confirm flicker value. If no operated for 10 sec, flicker value display will return back to display mode. This switch is used to carry down setting value in setting mode.

+
This switch is used to confirm the max. and min. value of each input. It changes the order from max. value → min. value. If no operated for 10 min, max. and min. value display will return back to display mode. This switch is used to carry up setting value in setting mode. It can replace the funcion with DISPLAY switch by setting.

DISPLAY
This is the switch which changes the input element with carries out bar graph display.
Main monitor → Sub monitor (L) → Sub monitor (R) →
Display mode will be change to setting mode 2 when continuously press this switch together with SET switch more then 3 sec.The function can be replaced by + switch for setting. Setting mode will return back to display mode after 1 action.

RESET/SHIFT
This switch is used to reset the hold max. and min.value. Max. and min. value will be reset when continuously press ON more then 1 sec. Use this switch to shift an item in the setting mode.

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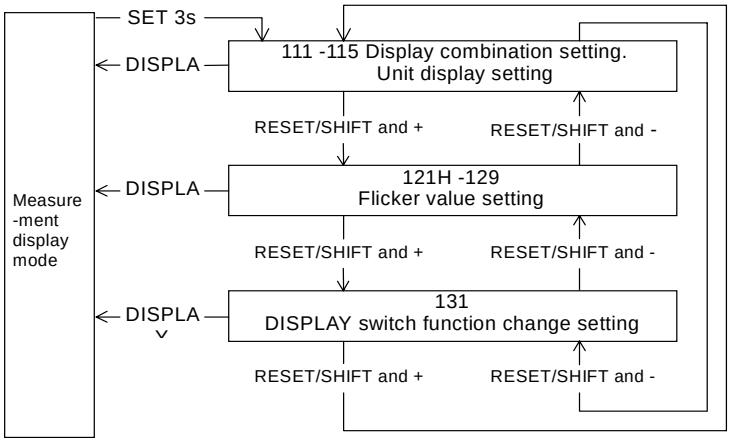
SETTING

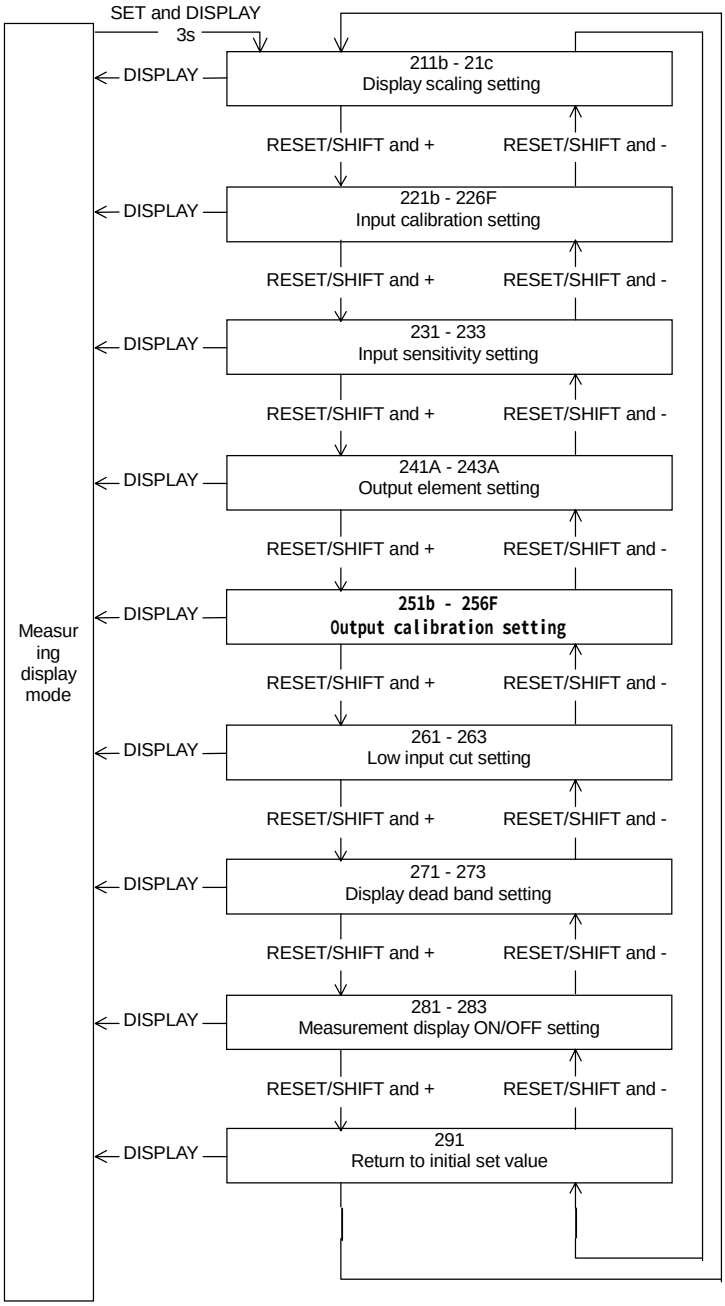
Refer to attached user's manual for setting method details.

SETTING-1



*Setting mode for communication output specification is slightly different from above.

SETTING-2



ELECTRONIC DC INPUT METER

TLC-110/ TLC-110L

LC-110 SERIES COMMON SPECIFICATION

Approved Standard/ Pulse Output/ Intensity

Item		Electronic multi meter	Electronic harmonics meter relay	Electronic demand multi meter	Electronic max./ min. multi meter	Electronic overload/ leakage detection meter relay	Electronic three phase current meter	Electronic three phase voltage meter	Electronic DC receiving meter	Electronic DC input meter
Type	No backlight	QLC-110	HLC-110	DLC-110	MLC-110	LLC-110	ALC-110	VLC-110	XLC-110	TLC-110
	With backlight	QLC-110L	HLC-110L	DLC-110L	MLC-110L	LLC-110L	ALC-110L	VLC-110L	XLC-110L	TLC-110L
Approved standard		JIS C 1102 -1, -2, -3, -4, -5, -7 JIS C 1111 JIS C 1216 JIS C 1263 Performance conformed EIA standard RS-485	JIS C 1102 -1, -2, -7 JIS C 1111 Performance conformed	JIS C 1102 -1, -2, -3, -5, -7 JIS C 1111 JIS C 1216 Performance conformed EIA standard RS-485	JIS C 1102 -1, -2, -7 JIS C 1111 Performance conformed EIA standard RS-485	JIS C 1102 -1, -2, -7 JIS C 1111 JIS C 8325 JIS C 8374 JIS C 1216 Performance conformed	JIS C 1102 -1, -2, -7 JIS C 1111 Performance conformed **Discontinued Model (since December 31,2011).**	JIS C 1102 -1, -2, -7 JIS C 1111 Performance conformed	JIS C 1102 -1, -2, -7, -9 JIS C 1111 JIS C 1010-1 Performance conformed EIA standard RS-485	JIS C 1102 -1, -2, -7, -8, -9 JIS C 1111 JIS C 1010-1 Performance conformed EIA standard RS-485
Pulse output	Output element	Watt-hour OR var-hour	-	Watt-hour	-	Watt-hour	-	-	-	-
	Outout pulse constant	*Output system: Photo MOS - FET relay 1 a contact. Contact capacity: AC, DC125V 70mA (resistance load, inductive load) Output ON resistance: 10Ω or less.								
		*Pulse width: 250ms ±10% (There is a case of 100 - 130ms by range setting.) When the output pulse cycle at the rated electric power becomes the speed of 2 pulses or more per second by setting voltage measurement range, current measurement range, and output pulse unit, the output pulse width becomes 100 - 130ms. *Output pulse cycle = Rated electric power [kW] / output pulse unit [kWh / pulse] / 3600 [sec.] For example: when voltage measurement range: 9000V (6600V / 110V), current range: 80.0A (80A / 5A), output pulse unit: 0.1 kWh / pulse rated electric power = 1kW × (6600 / 110V) × (80 / 5A) = 960 [kW] output pulse cycle = 960 [kW] / 0.1 [kWh / pulse] / 3600 [sec.] = 2.667 pulse / sec. pulse width becomes 100 - 130ms.								
		*Output pulse unit can be set in following range. Output pulse unit is not changed by changing measuring range.								
		Three phase 3 wire / Three phase 4 wire: Full load power (kW, kvar) = $\sqrt{3}$ × rated voltage (V) × rated current (A) × 10^{-3}								
		Single phase 3 wire : Full load power (kW, kvar) = 2 × rated voltage (V) × rated current (A) × 10^{-3}								
		Single phase : Full load power (kW, kvar) = Rated voltage (V) × rated current (A) × 10^{-3}								

Full load power (kW, kvar)		Output pulse unit kWh (kvarh) / pulse				Multiplying factor
Below1		0.1	0.01	0.001	0.0001	0.01 *(1)
1 or more	Below 10	1	0.1	0.01	0.001	0.1
10 or more	Below 100	10	1	0.1	0.01	1
100 or more	Below 1000	100	10	1	0.1	10
1,000 or more	Below 10,000	1,000	100	10	1	100
10,000 or more	Below 100,000	10,000	1,000	100	10	1,000
100,000 or more	Below 1,000,000	100,000	10,000	1,000	100	10,000

*(1) Only applied for DLC-110/ 110L.
Multiplying factor is 0.01, but multiplying factor display becomes with 0.1.
(Integer digit: 4 digits display. Enlarged display: 4 digits after decimal point.)

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LC-110 SERIES COMMON SPECIFICATION

Approved Standard/ Pulse Output/ Intensity

Strength	Overload capacity	(1) Voltage circuit: 2 times of rated voltage (10sec.) 1.2 times (continuity)
		(2) Current circuit: 40 times of rated current (1 sec.), 20 times (4 sec.), 10 times (16 sec.), 1.2 times (continuity)
		(3) Aux. power: 1.5 times of rated voltage (10 sec.), 1.2 times (continuity), 1.5 times of rated voltage at DC100/ 110 (10 sec.), 1.3 times (continuity)
		(4) DC input circuit (4 to 20mA): 10 times of rated current (5 sec.), 1.2 times (continuity)
	Insulation resistance	(1) Between electrical system and case (ground) DC500V 50MΩ or more
		(2) Between input, output and auxiliary power DC500V 50MΩ or more
		(3) Between analog output and pulse output DC500V 50MΩ or more (QLC, DLC, LLC)
		(4) Between analog output and alarm output DC500V 50MΩ or more (HLC, DLC, MLC, LLC)
		(5) Between communication output and pulse output DC500V 50MΩ or more (QLC, DLC)
		(6) Between communication output and alarm output DC500V 50MΩ or more (DLC,MLC)
		(7) Between pulse output and alarm output DC500V 50MΩ or more (DLC,LLC)
		(8) Between alarm output 1 and alarm output 2 DC500V 50MΩ or more (HLC,LLC)
		(9) Between DC input (4 to 20mA), AC input and auxiliary power DC500V 50MΩ or more (QLC with DC input)
		(10) Between DC inputs DC500V 50MΩ or more (XLC,TLC)
		(11) Non-insulation by minus common between analog outputs. (QLC, DLC, HLC, XLC, TLC, MLC)
	Withstand voltage	(1) Between electrical system and case (ground) AC2000V 50/ 60 Hz 1 min.
		(2) Between input, ouutput and auxiliary power AC2000V 50/ 60 Hz 1 min.
		(3) Between analog output and pulse output AC1500V 50/ 60 Hz 1 min. (QLC, DLC, LLC)
		(4) Between analog output and alarm output AC1500V 50/ 60 Hz 1 min. (HLC, DLC, MLC, LLC)
		(5) Between communication output and pulse output AC1500V 50/ 60 Hz 1 min. (QLC, DLC)
		(6) Between communication output and alarm output AC1500V 50/ 60 Hz 1 min. (DLC, MLC)
		(7) Between pulse output and alarm output AC1500V 50/ 60 Hz 1 min. (DLC, LLC)
		(8) Between alarm output 1 and alarm output 2 AC1500V 50/ 60 Hz 1 min. (HLC, LLC)
		(9) Between DC input (4 to 20mA), AC input and auxiliary power AC2000V 50/ 60 Hz 1 min. (QLC with DC input)
		(10) Between DC inputs AC2000V 50/ 60 Hz 1 min. (XLC, TLC)
		(11) Non-insulation by minus common between analog outputs. (QLC, DLC, HLC, XLC, TLC, MLC)
	Lightning impulse withstand voltage	(1) Between electrical system (analog output/ communication output excluded) and ground 6kV 1.2/ 50μs positive/ negative polarity 3 times for each (QLC, DLC)
		(2) Between electrical system (DC input 4 to 20mA excluded) and ground 5kV 1.2/ 50μs positive/ negative polarity 3 times for each
		(3) Between analog output or communication output and ground 5kV 1.2/ 50μs positive/ negative polarity 3 times for each (QLC,DLC)
		(4) Between auxiliary power and ground 7kV 1.2/ 50μs positive/ negative polarity 3 times for each (LLC)
	Noise capacity	(1) Oscillatory surge voltage 1 to 1.5MHz peak voltage: When attenuated oscillatory waveform (2.5 to 3kV) is applied repeatedly: Measured error: within 10% (power circuit, AC voltage circuit, AC current circuit, XLC, TLC: DC voltage/ current circuit) No communication error/ communication halt
		(2) Square-wave impulse noise Noise (1μS, 100ns width) is repeatedly applied for 5 min. : Measured error is within 10% AC voltage/ AC current circuit (normal/ common) 1.5 kV or more — Power circuit (normal/ common) 1.5 kV or more Pulse output (common) 1.0 kV or more — Alarm output (common) 1.0 kV or more Operation input (common) 1.0 kV or more — Analog output (Inductive) 1.0 kV or more Communication output (Inductive) 1.0kV or more
		(3) Radio noise: When radion wave (150, 400, 900MHz) is applied (5W, 1m) intermittently: Measured error is within 10%
		(4) Electrostatic noise: At the passage of electric current 8kV Measured error : within 10% At no passage of electric current 10kV: No damage (condenser charge system)
		Note: There are some cases that some item can not be applied for particular model. Refer to type and specification code.
	Vibration/ shock	Vibration: 1/ 2 peak-peak: 0.15mm 10 to 55Hz 1 octave/ min. 5 times sweep
		Shock: 490m/s² 3 times for each direction.

ELECTRONIC DC INPUT METER

TLC-110/ TLC-110L

DISPLAY COMBINATION (Pattern)

No.	Pattern NO.	1 Input Specification			2 Input Specification			3 Input Specification			Bar Graph	INPUT Display
		Main monitor	Sub-monitor (L)	Sub-monitor (R)	Main monitor	Sub-monitor (L)	Sub-monitor (R)	Main monitor	Sub-monitor (L)	Sub-monitor (R)		
1	Pattern 1	Input 1	-	-	Input 1	Input 2	-	Input 1	Input 2	Input 3	Input 1 (Change Input 2, 3: Possible)	Light ON/ OFF
2	Pattern 2	-	-	-	Input 1	-	Input 2	Input 1	Input 3	Input 2	Input 1 (Change Input 2, 3: Possible)	Light: OFF
3	Pattern 3	-	-	-	Input 2	Input 1	-	Input 2	Input 1	Input 3	Input 2 (Change Input 1, 3: Possible)	Light: OFF
4	Pattern 4	-	-	-	Input 2	-	Input 1	Input 2	Input 3	Input 1	Input 2 (Cahnge Input 1, 3: Possible)	Light: OFF
5	Pattern 5	-	-	-	-	Input 1	Input 2	Input 3	Input 1	Input 2	Input 3 (Change Input 1, 2: Possible)	Light: OFF
6	Pattern 6	-	-	-	-	Input 2	Input 1	Input 3	Input 2	Input 1	Input 3 (Change Input 1, 2: Possible)	Light: OFF
7	Pattern 7	-	-	-	W	A *(1)	V *(1)	W	A *(1)	V *(1)	W (Change A, V: Possible)	Light: OFF
8	Pattern 8	-	-	-	W	V *(1)	A *(1)	W	V *(1)	A *(1)	W (Change A, V: Possible)	Light: OFF
9	Pattern 9	-	-	-	A *(1)	V *(1)	W (lettering)	A *(1)	V *(1)	W (lettering)	A (Change V, W: Possible)	Light: OFF
A	Pattern A	-	-	-	A *(1)	W (lettering)	V *(1)	A *(1)	W (lettering)	V *(1)	A (Change V, W: Possible)	Light: OFF
B	Pattern B	-	-	-	V *(1)	A *(1)	W (lettering)	V *(1)	A *(1)	W (lettering)	V (Change A, W: Possible)	Light: OFF
C	Pattern C	-	-	-	V *(1)	W (lettering)	A *(1)	V *(1)	W (lettering)	A *(1)	V (Change A, W: Possible)	Light: OFF

Only several elements of input circuit are displayed.
Example: In case of 1 input: Only main monitor (Input 1) is displayed. Sub-monitor (L), (R): No display.
Note: *(1)
Please make a selection from pattern 7 to pattern C when specify for the electric power measurement.
Position A and V from pattern 7 to pattern C is displayed becomes of specify A measurement in input 1 and V measurement in input 2.
When input 1 with V measurement and input 2 with A measurement, display of the above-mentioned will be change from A to V and V to A displayed.
Electric power measurement will be operate when A and V measurement is specified for either input 1 or input 2.
Please do not replace the input and attention that it will be reason of the breakdown.

ELECTRONIC DC INPUT METER

TLC-110/ TLC-110L

INITIALIZATION VALUE

No.	Setting item		Setting value
1	Display combination	Pattern	Pattern 1
		Main monitor	Input 1
		Sub-monitor (L)	Input 2
		Sub-monitori (R)	Input 3
		Bar graph	Input 1
		INPUT display ON/ OFF	ON
2	Unit display	Input 1 (A)	No display
		Input 2 (V)	No display
		Input 3 (W)	No display
3	Flicker	Input 1 (A) upper limit	100% against display span
		Input 1 (A) lower limit	0% against display span
		Input 1 (A) flicker ON/OFF	OFF
		Input 2 (V) upper limit	100% against display span
		Input 2 (V) lower limit	0% against display span
		Input 2 (V) flicker ON/OFF	OFF
		Input 3 (W) upper limit	100% against display span
		Input 3 (W) lower limit	0% against display span
		Input 3 (W) flicker ON/OFF	OFF
4	DISPLAY switch function		Bar graph display change
5	Display scaling	Input 1 (A)	0.0 - 100.0
		Input 2 (V)	0.0 - 100.0
		Input 3 (W)	0.0 - 100.0
6	Input calibration	Input 1 (A)	Bias: 0.00%, Span: 0.00%
		Input 2 (V)	Bias: 0.00%, Span: 0.00%
		Input 3 (W)	Bias: 0.00%, Span: 0.00%
7	Input sensitivity	Input 1 (A)	100%
		Input 2 (V)	100%
		Input 3 (W)	100%
8	Output element	Input 1	Input 1
		Input 2	Input 2
		Input 3	Input 3
9	Output calibration	Input 1	Bias: 0.00%, Span: 0.00%
		Input 2	Bias: 0.00%, Span: 0.00%
		Input 3	Bias: 0.00%, Span: 0.00%
10	Low input cut	Input 1 (A)	OFF
		Input 2 (V)	OFF
		Input 3 (W)	OFF
11	Display dead band	Input 1 (A)	0.0%
		Input 2 (V)	0.0%
		Input 3 (W)	0.0%
12	Measuring display ON/OFF	Input 1 (A)	ON
		Input 2 (V)	ON
		Input 3 (W)	ON

In case of communication output specification:
Setting items No.8 - 11 is as below.

No.	Setting item		Setting value
8	Communication output	Address	1
		Transmission speed	9600bps
		Data bits	7 bits
		Parity	Even (E)
		Stop bit	1 bit
		Checksum addition range setting	ETX included
9	Low input cut	Input 1 (A)	OFF
		Input 2 (V)	OFF
		Input 3 (W)	OFF
10	Display dead band	Input 1 (A)	0.0%
		Input 2 (V)	0.0%
		Input 3 (W)	0.0%
11	Measuring Display ON/ OFF	Input 1 (A)	ON
		Input 2 (V)	ON
		Input 3 (W)	ON