

# ECONOMIC INDICATOR

## DESCRIPTION

195PM series Indicator has been designed in simple function and 4 digital 20.0mm LED displays with economic cost. They are also can be programmed by tack switches that are hidden in backside of front bezel.



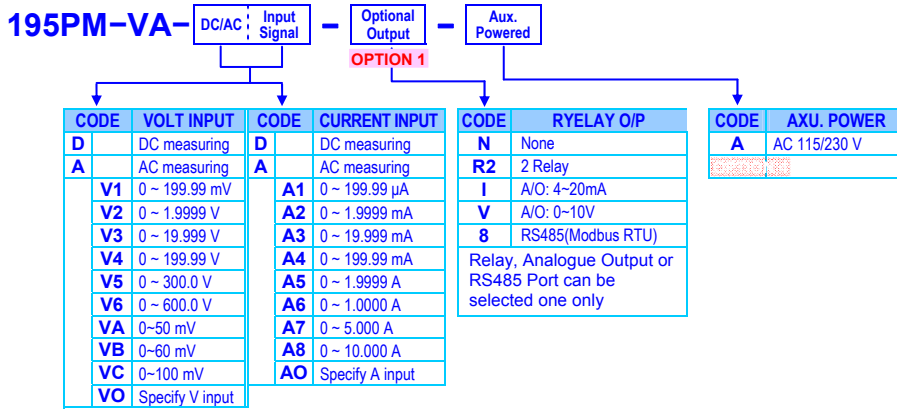
## FEATURE

- Measuring AC / DC Voltage 0~600V / Current 0~10A
- Optional output available for one of 2 relay, analogue or RS485
- CE Approved & RoHS

## APPLICATIONS

- Testing Equipments for Volt/Current Measuring,
- MCC panel, Machinery, Switch gear... for Voltage or Current Measuring

## ORDERING INFORMATION



## TECHNICAL SPECIFICATION

Input Range		Measuring Range DC / AC	Input Impedance	Measuring Range DC / AC	Input Impedance
Voltage	0~50/~100	≥5M ohm	Current	0~199.99μA	1K ohm
	0~199.99 mV	≥5M ohm		0~1.9999 mA	100 ohm
	0~1.9999 V	≥1M ohm		0~19.999 mA	10 ohm
	0~19.999 V	≥1M ohm		0~199.99 mA	1 ohm
	0~199.99 V	≥1M ohm		0~1.9999 A	0.05 ohm
	0~300.0 V	≥2M ohm		0~5.000 A	0.02 ohm
0~600.0 V	≥2M ohm	0~10.000 A	0.01 ohm		

**Calibration:** Digital calibration by front key  
**A/D converter:** 12 bits resolution  
**Accuracy:** DC:  $\leq \pm 0.1\%$  of FS  $\pm 1C$   
 AC:  $\leq \pm 0.2\%$  of FS  $\pm 1C$   
**Sampling rate:** 15 cycles/sec  
**Response time:**  $\leq 100$  msec.(when the AvG = "1") in standard

**Display & Functions**  
**LED:** Numeric: 4 digits, 0.8"(20.0mm) red high-brightness LED  
**Display range:** -1999~+9999  
**Scaling function:** L<sub>0</sub>S<sub>C</sub>: Low Scale; Settable range: -1999~+9999  
 H<sub>0</sub>S<sub>C</sub>: High Scale; Settable range: -1999~+9999  
**Decimal point:** Programmable from 0 / 00 / 000 / 0000  
**Over range Indication:** ouF<sub>L</sub>, when input is over 110% of input range Hi  
**Under range indication:** -ouF<sub>L</sub>, when input is under -0% of input range Lo  
**Max / Mini recording:** Maximum and Minimum value storage during power on.  
**Low cut:** L<sub>0</sub>U<sub>t</sub>: Settable range: -1999~9999 counts

**Reading Stable Function**  
**Average:** R<sub>0</sub>U Settable range: 1~99 times  
**Moving average:** R<sub>0</sub>MU Settable range: 1(None)~99 times  
**Digital filter:** dF<sub>0</sub>L Settable range: 0(None)/1~99 times

### Control Functions(option)

**Set-points:** Two set-point  
**Control relay:** 2 Relay, FORM-C, 5A/230Vac, 10A/115V  
**Relay energized mode:** Energized levels compare with set-points:  
 Hi / Lo / Hi.HLd / Lo.HLd programmable  
**Energizing functions:** Start delay / Energized & De-energized delay / Hysteresis Energized Latch  
**Start band**(Minimum level for Energizing): 0~9999counts  
**Start delay time:** 0:00.0~9(Minutes):59.9(Second)  
**Energized delay time:** 0.00.0~9(Minutes):59.9(Second)  
**De-energized delay time:** 0.00.0~9(Minutes):59.9(Second)  
**Hysteresis:** 0~5000 counts

### Analogue output(option)

**Accuracy:**  $\leq \pm 0.2\%$  of F.S.  
**Ripple:**  $\leq \pm 0.1\%$  of F.S.  
**Response time:**  $\leq 100$  msec. (10~90% of input)  
**Isolation:** AC 2.0 KV between input and output  
**Output range:** Specify either Voltage or Current output in ordering  
**Voltage:** 0~5V / 0~10V / 1~5V programmable  
**Current:** 0~10mA / 0~20mA / 4~20mA programmable  
**Output capability:** Voltage: 0~10V;  $\geq 1000\Omega$ ;  
 Current: 4(0)~20mA;  $\leq 600\Omega$  max  
**Functions:** R<sub>0</sub>A<sub>0</sub>H<sub>5</sub> (output range high): Settable range: -1999~9999  
 R<sub>0</sub>A<sub>0</sub>L<sub>5</sub> (output range Low): Settable range: -1999~9999  
**Digital fine adjust:** R<sub>0</sub>A<sub>0</sub>P<sub>0</sub>: Settable range: -38011~+27524  
 R<sub>0</sub>A<sub>0</sub>S<sub>0</sub>P<sub>0</sub>: Settable range: -38011~+27524

### RS 485 Communication(option)

**Protocol:** Modbus RTU mode  
**Baud rate:** 1200/2400/4800/9600/19200/38400 programmable  
**Data bits:** 8 bits  
**Parity:** Even, odd or none (with 1 or 2 stop bit) programmable  
**Address:** 1 ~ 255 programmable  
**Distance:** 1200M  
**Terminate resistor:** 150Ω at last unit.

**Electrical Safety**

**Dielectric strength:** AC 2.0 KV for 1 min, Between Power / Input / Output / Case  
**Insulation resistance:** ≥100M ohm at 500Vdc, Between Power / Input / Output  
**Isolation:** Between Power / Input / Relay, Analogue or RS485  
**EMC:** EN 55011:2002; EN 61326:2003  
**Safety(LVD):** EN 61010-1:2001

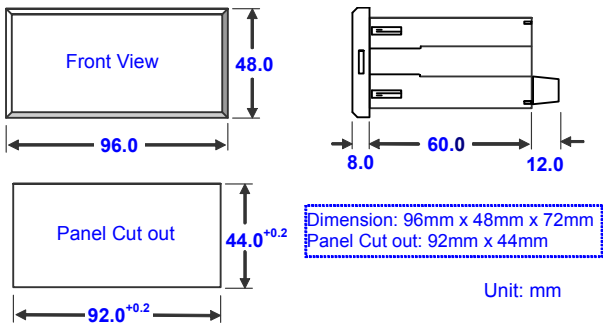
**Environmental**

**Operating temp.:** 0~60 °C  
**Operating humidity:** 20~95 %RH, Non-condensing  
**Temp. coefficient:** ≤100 PPM/°C  
**Storage temp.:** -10~70 °C  
**Enclosure:** Front panel: IEC 549 (IP54); Housing: IP20

**Mechanical**

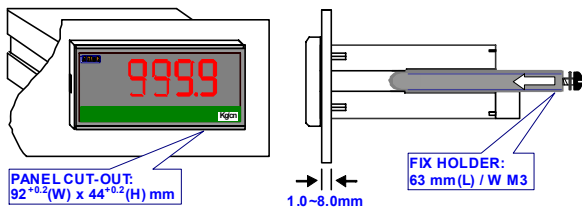
**Dimensions:** 96mm(W) x 48mm(H) x 72mm(D)  
**Panel cutout:** 92mm(W) x 44mm(H)  
**Case materiel:** ABS fire-resistance (UL 94V-0)  
**Mounting:** Panel flush mounting  
**Terminal block:** Plastic NYLON 66 (UL 94V-0)  
 20A/600Vac, M3.5, 12~22AWG  
**Weight:** 350g

**■ DIMENSIONS**



**■ INSTALLATION**

The meter should be installed in a location that dose not exceed the maximum operating temperature and provides good air circulation.



**■ CONNECTION DIAGRAM**

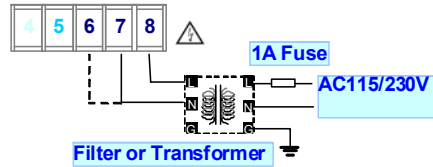
**Terminal blocks:**  
 20A/600Vac, M3.5, 1.2~3.5mm<sup>2</sup> (22~12AWG)



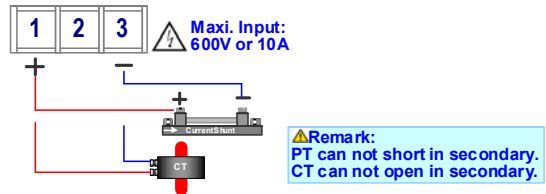
**Power and Input**

Please check the voltage of power supplied first, and then connect to the specified terminals. It is recommended that power supplied to the meter be protected by a fuse or circuit breaker.

**Power Supply**



**CM1-VA Input connection**

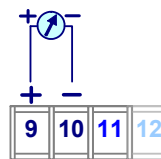


**Output ( one output available of Relay, Analogue or RS485 )**

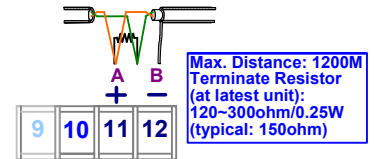
**Relay output**



**Analogue output**



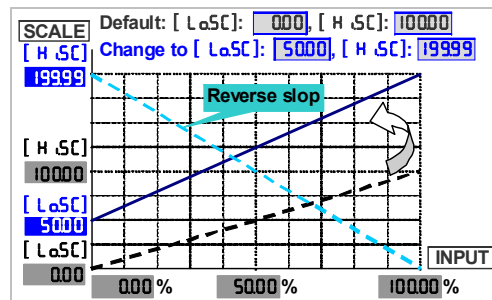
**RS485 port**



**■ FUNCTION DESCRIPTION**

**Scaling function:**

Setting the [ L<sub>o</sub>SC ] (Low scale) and [ H<sub>o</sub>SC ] (High scale) in [ mPUT GROUP ] to relative input signal. Reverse scaling will be done too. Please refer to the figure as below,



\*Too narrow scale may course display lower resolution.

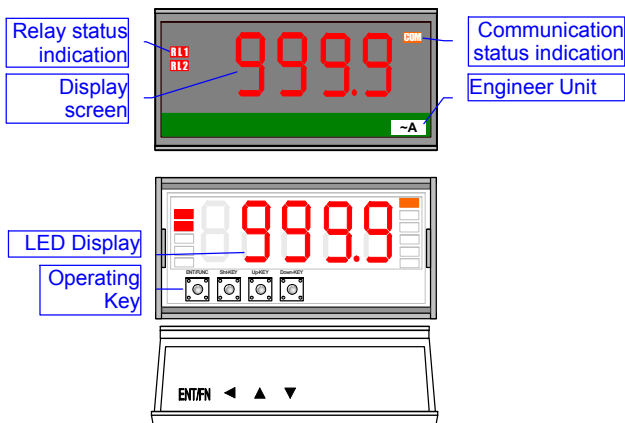
## OPERATING KEY

\*Please access to the Programming Level to check and set the parameters when users start to run the meter

- Operating Key:** 4 keys for Enter(Function) / Shift(Escape) / Up key / Down key
- The meter has designed operation similar as PC's and . In any page, press key means "enter" or "confirm setting", and press key means "escape()" or "shift".
- In Programming Level, the screen will return to Measuring Page after do not press any key over 2 minutes, or press for 1 second.

	Function Index	Setting Status
(= ) <b>Enter/Fun key</b>	(1) In any page, press  to access the level or function index (2) From the function index to access setting status	(3) Setting Confirmed, save to EEPROM and go to next function index
(= ) <b>Shift key</b>	(1) In measuring page, press  for 1 second to access user level. (2) In function index, press  for 1 second to go back upper level. (3) In function group index, press  for 1 second to go back measuring page	(4) In setting status, press  to Shift the setting position. (5) In setting status, press  for 1 second to abort setting and go back this function index.
(= ) <b>Up key</b>	(1) In function index, press  to go back to previous function index	(2) In setting status for function, press  to select function (3) During number Setting, press  can roll the digit up
(= ) <b>Down key</b>	(1) In Function Index Page, press  will go to the next Function Index Page.	(2) In setting status for function, press  to select function (3) During number Setting, press  can roll the digit down.

## FRONT PANEL



### Number screen

0.8"(20.0mm) red high-brightness LED for 5 digital present value.

### I/O Status Indication

- Relay Energized:** 2 square red LED  
 display when Relay 1 energized;  
 display when Relay 2 energized;
- RS485 Communication:** 1 square orange LED  
 will flash when the meter is receive or send data, and flash quickly means the data transient quicker.

### Stickers:

Each meter has a sticker for engineer units.

~μA	~mA	~A	~KA	=μA	=mA	=A	=KA		
~μV	~mV	~V	~KV	=μV	=mV	=V	=KV		
A hr	A min	A sec	A rms	V rms	A/mA	W/A	Var/A		
W	KW	MW	WH	KWH	MWH	W/WH	W/Var		
Var	KVar	MVar	QH	KQH	MQH	COSφ	Var/VarH		
VA	KVA	MVA	VAH	KVAH	MVAH	φ	KVarH		
Hz	PF	KA	KV	KHz	MVarH	KM/hr			
A	mA	V	mV	Ω	KΩ	°C	°F	%RH	
RPM	M/min	Y/min	F/min	M/sec	%		MΩ		
Kg/cm <sup>2</sup>	Bar	mmH <sub>2</sub> O	mmHg	KPA	mmAq	PSI	mBar	PA	
M <sup>3</sup> /min	ml/min	Ton/D	L/min	Torr	M <sup>3</sup> /hr	Kg-cm	cmHg		
mm	cm	M	KM	ft	Yard	ppm	ppb		
g	KG	Ton	T-cm	NT-cm	PH	MPM	L		

- Operating Key:** 4 keys for Enter(Function) / Shift(Escape) / Up key / Down key

- Pass Word:** Settable range:0000~9999;

User has to key in the right pass word so that get into [Programming level]. Otherwise, the meter will go back to measuring page. If user forgets the password, please contact with the service window.

# OPERATING DIAGRAM (The detail description of operation, please refer to operating manual.)

