

DIGITAL MICROPROCESSOR MULTIFUNCTION TRMS POWER METER

SERIES 7200

Model KM 7200 A



FEATURES :

3 Displays at one time : 3V, 3A, W, Var, WH, VarH, PF, Hz (total 12 parameters)
Applicable Standard : DIN IEC 688
Output / Display / Setting Range User Selectable
Suitable for : 1 2 W ; 1 3 W ; 3 3 W ; 3 4 W Systems.

10 Years Power - Off Memory for WH & VarH
With RS - 485 or RS - 232 Communications Ports, Modbus RTU Output
Software for Load Analysis (optional)
User friendly programming.

SPECIFICATIONS :

INPUT :

Input Voltage Range : Normal Voltage 110 V, Effective Range 85 ~ 150 V.
Normal Voltage 220 V, Effective Range 160 ~ 300 V AC
Input Voltage Over Range : Normal AC 110 V, Over 500 V Continuous.
Input Frequency : 45 Hz ~ 70 Hz.

Input Current Range : Normal Current 5 A, Effective Range 0 ~ 7.5 A, Normal Current 1 A, Effective Range 0 ~ 1.5 A.
Input Current Over Range : Normal AC 5 A, Over 15 A Continuous.
Input Burden : Voltage 0.25 VA / Unit, Current 0.25 VA / Unit, at 50 / 60 Hz

OUTPUT :

Output Response time : 1 Sec.
Output Protection : Without Damage for Output Open or Short Circuit.
Digital Output : RS-485 output , 1200, 2400 , 4800, 9600, 19200 Baud rate , User Selectable.

D C Current : 0 - 20 mA DC
Load resistance drive : output drive 10 V D C max.
D C Voltage : 0 - 10 V DC
Load resistance drive : output drive 5 mA max.

PERFORMANCE :

Accuracy : V, A, W, = $\pm 0.2\%$ Fs + 2 Counts at 23°C $\pm 3^\circ\text{C}$.
: Var, WH, VarH, PF = $\pm 0.4\%$ RD + 2 Counts
: Hz = $\pm 0.02\%$ Fs + 1 C at 23°C $\pm 3^\circ\text{C}$.
Display Range : V, A, W, Var, PF, Hz, 0.56" Super RED LED
4 Digits = 0 ~ 9999 Counts.
PT, CT User Selectable.
WH; VarH, 0.56" Super RED LED,
6 Digits = 0 ~ 999999 Counts.

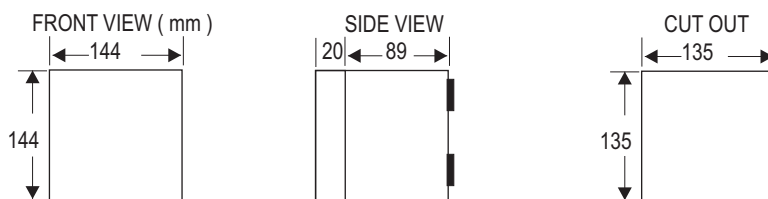
Response Time: 1 Sec.
Dielectric Strength: AC 2.8KV / Min, Input / Power / Case, DIN IEC 688.
Impulse: 6 KV 1.2 x 50 μs , ANSI C37.90a / 1983. DIN IEC 255 - 4.
Stability: 0.2% / Year
Operation Condition: -10°C ~ + 55°C; 20 ~ 95% RH Non - Condensed.
Storage Condition: - 40°C ~ +75°C; 20 ~ 95% RH Non - Condensed
Power Supply: AC 85 ~ 265 V and DC 100 ~ 300 V Power.
Mounting: Panel Flush Mounting.

Model KM 7200 A

INPUT (V)		INPUT CURRENT		OUTPUT		SETTING FUNCTION		AUX. POWER	
A	55 ~ 300V	A	1A	F	RS485 modbus	A	4 Units Hi-Lo set	C	DC 24V
C	300 ~ 600V	B	5A	O	4 Units Analog			F	AC 85~265V
				M	4 Units Analog+RS485				DC 100~300V
				Q	Full Function				
				N	NONE	N	NONE		
Y	SPECIAL	Y	SPECIAL	Y	SPECIAL	Y	SPECIAL	Y	SPECIAL

In 3 4 system, the Voltage (INPUT (V)) is Line - Neutral Voltage
When ordering Specify Model code number and Variable (e.g. KM - 7200A - A - B - F - N - F)
Code number : Model - Input V - input C - Output - setting - power.

DIMENSION :



All Specifications are subject to change without prior notice



An ISO 9001:2008 Company

MULTIFUNCTION POWER METER

MODEL DMPW 7200-A

OPERATION MANUAL

Microprocessor Multifunction Power Meter

MODEL DMPW-7200-A

Features :

- Applicable Standard : Answer for DIN-IEC 688
- Output/Display/Setting Range User Selectable
- Filp Display at one time: : 3V· 3A· W· Var· WH· VarH· PF· Hz· Harmonics
- Measurable 1φ 2W; 1φ 3W; 3φ 3W; 3φ 4W.
- Harmonics Analyze Voltage, Current for 31 times, Display for 15 times.
- 10 Years Power-Off Memory for WH & VarH
- Demand Management & Demand Control
- With RS-485 & RS 232,2 Communication Ports, Modbus RTU Output



MODEL : DMPW
 DMPWH Harmonics
 DMPWD Demand

INPUT		INPUT/C		OUTPUT		SETTING FUNCTION		AUX. POWER	
A	55 ~ 300V	A	1A	F	RS-485 modbus	A	4 Units Hi-Lo set	C	DC 24V
C	300 ~ 600V	B	5A	O	4 Units Analog			F	AC 85~265V
				M	4 Units Analog+RS-485				DC 100~300V
Y	SPECIAL	Y	SPECIAL	P	Print Function+RS-485	N	NONE	Y	SPECIAL
				Q	Full Function	Y	SPECIAL		
				N	NONE				
				Y	SPECIAL				

3φ 4W Voltage Line-Neutral

Specifications :

INPUT :

- Input Frequency : 45Hz ~ 70Hz.
 Input Burden : Voltage 0.25VA/Unit, Current 0.25VA/Unit, as 50/60Hz.
 Input Range : Normal Voltage 110V, Effective Range 85~150V. Normal Voltage 220V, Effective Range 160 ~ 300V AC.
 Normal Current 5A, Effective Range 0 ~ 7.5A. Normal Current 1A, Effective Range 0 ~ 1.5A.
 Input Over : Normal AC 5A, Current Over 15A Continuous : 50A 10 Sec/Hour : 400A 0.5 Sec/Hour.
 Normal AC 110V, Voltage Over 500V Continuous : 1200V 10 Sec/Hour.

OUTPUT :

DC Current : 0 - 20 mA DC

Load resistance drive : output drive 10 VDC maximum

Output	Load Resistance
0 - 10 mA :	1000 Ω
0 - 20 mA :	500 Ω
4 - 20 mA :	500 Ω

DC Voltage : 0 - 10 V DC

Load resistance drive : output drive 5mA maximum

Output	Load Resistance
0 - 5 V :	1 KΩ
1 - 5 V :	1 KΩ
0 - 10 V :	2 KΩ

Output Protection : Without Damage for Output Open or Short Circuit.

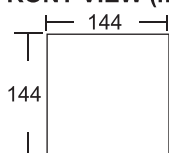
Output Response Time : ≤ 1 Sec.

Digital Output Load : RS-485 Output, Isolate Type with MODBUS RTU mode., 4800,9600,19200 Baud Rate, User Selectable.

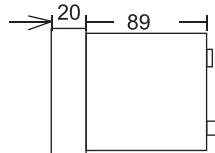
INSTALLATION & PERFORMANCE :

- Accuracy : V· A· W· = ±0.2% Fs+2 Counts at 23°C ±3°C. Var· WH· VarH· PF = ±0.4%RD+2 Counts,
 Hz = ±0.02% Fs+1C at 23°C ± 3°C., Thd = ±2%
 Display Range : V· A· W· Var· PF· Hz, 0.56" Super Red LED 4 Digits =0~9999 Counts, PT· CT User Selectable.
 WH; VarH, 0.56" Super Red LED, 6 Digits = 0 ~ 999999 Counts.
 Response Time : ≤1 Sec.
 Dielectric Strength : AC 2.8KV / Min, Input/Power/Case, DIN IEC 688.
 Impulse : 6 KV 1.2x50 uS, ANSI C37.90a / 1983. DIN IEC 255 -4.
 Stability : ≤0.2% / Year.
 Temperature Coefficient : ≤100ppm / °C from 0 ~ 60°C,
 Operation Condition : -10°C ~ +55°C 20 ~ 95% RH Non-Condensed.
 Storage Condition : -40°C ~ +75°C 20 ~ 95% RH Non-Condensed.
 Power Supply : AC 85~265V and DC 100~300V of Power .
 Mounting : Panel Flush Mounting.

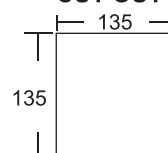
FRONT VIEW (mm)



SIDE VIEW



CUT OUT

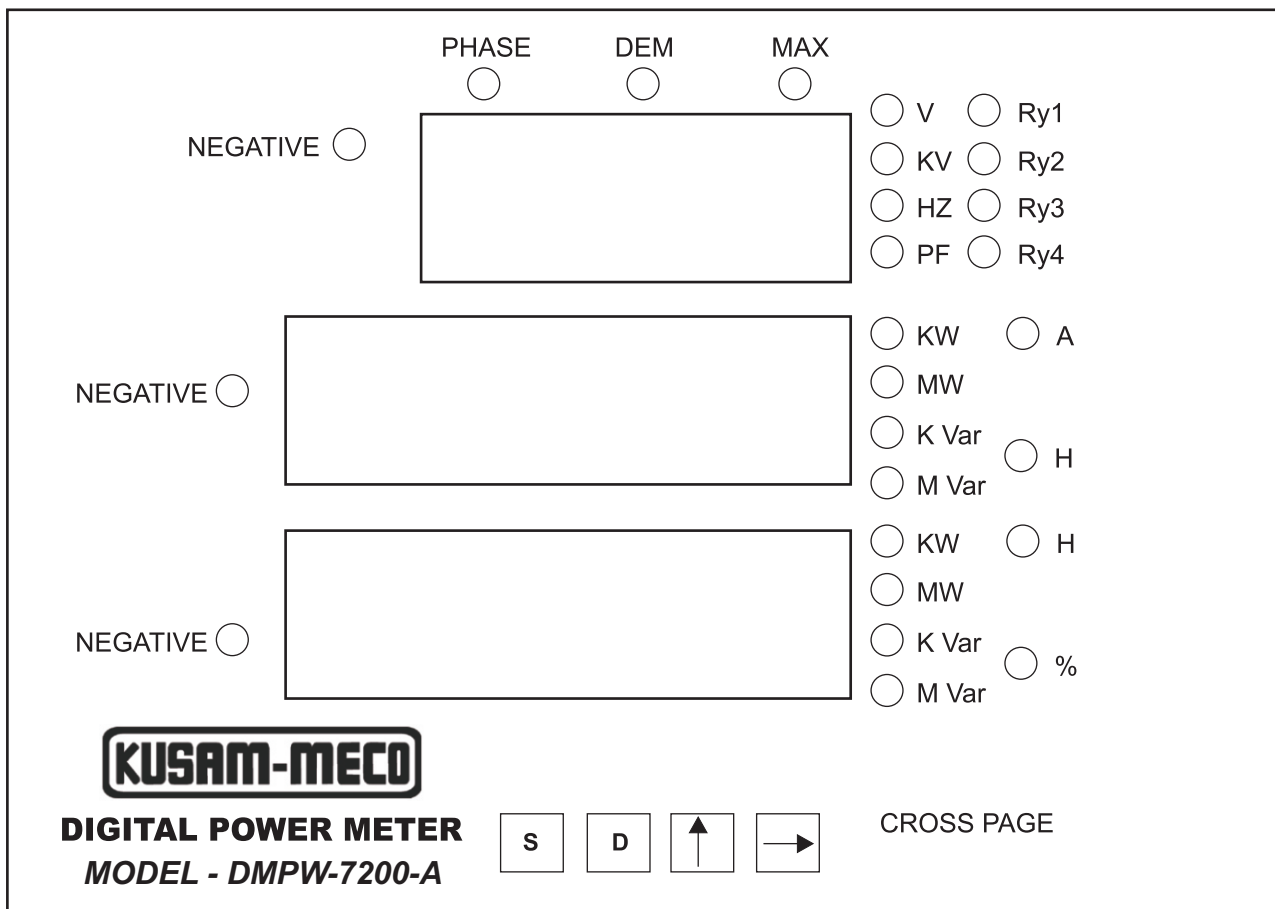




***MICROPROCESSOR MULTIFUNCTION POWER METER-
DMPW-7200-A***

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1. Panel Operation :



Function :

S : SELECT BIT
D : DATA

↑ : UP (change number)
 → : RIGHT (shift digit)

"S" Button :

1. **S** (to enter setting mode) ' and display 01 data.
2. **D** (to enter 01 setting function) ' then press D to 02 (setting data).
3. As entering setting value ' perform ↑ and → to change setting value.
4. On mode 01 "Wait", operate **S** to select each function point 01,02,...,09.
5. Or press **D** only ' order sequence is : 01 ~ setting value ~ 02 ~ setting value ~ 03 ~ setting value ~ 04 ~ setting value ~ and so on.

"↑ →" : Cross Pages (First Page ↔ Fourth Page)

2. Display Description :

First Page Basic Display

RV (L-L Voltage)
A1 (R Phase Current)
W (Total Watt)
S D ↑ →

Second Page

RV (L-L Voltage)
SV (L-L Voltage)
TV (L-L Phase Voltage)
S D ↑ →

Line Voltage

Third Page

RV (L-N Voltage)
SV (L-N Voltage)
TV (L-L Voltage)
S D ↑ →

When 3P4W, Phase Voltage display shines

Fourth Page

A1 (R Phase Current)
A2 (S Phase Current)
A3 (T Phase Current)
S D ↑ →

Fifth Page

W1 (R Watt)
W2 (S Watt)
W3 (T Watt)
S D ↑ →

Sixth Page

HZ (Frequency)
S D ↑ →

Seventh Page

PF (Power Factor)
W (Total Watt)
Var (Total Var)
S D ↑ →

Eighth Page

WH (Watthour)
-WH (Watthour)
S D ↑ →

Light ●

Ninth Page

VarH (Varhour)
-VarH (Varhour)
S D ↑ →

●

Tenth Page

Thd (V/KV)
Voltage Total harmonics
Voltage Total harmonics Percentage
S D ↑ →

Eleventh Page

Thd (A)
Current Total harmonics
Current Total harmonics Percentage
S D ↑ →

Twelfth ~ Fifteenth Page

H-01 ~ 13 (V/VK)
Voltage 1.5.9.13 times Harmonics
Voltage 3.7.11.15 times Harmonics
S D ↑ →

1. Sixteenth ~ nineteenth pages is current single harmonic display value.
2. Note unit mark lights of display.

DEM ●

Demand Remaining time

Remaining Demand

Present Demand

S D ↑ →

DEM ●

Maximum Demand

Target Demand

Demand Forecast

S D ↑ →

DEM ● MAX ●

Historical Max Demand

Year/Mon/Day

Hour/Sec/Min

S D ↑ →

3. Number Setting :

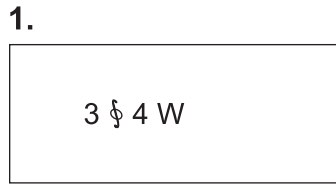
3.1 Enter 01 ~ 09 functions and setting Value, press " ↑ & → " to change setting value.

Press "S", enter setting value condition, 01 display shines, then press "D", the screen shows as follows :

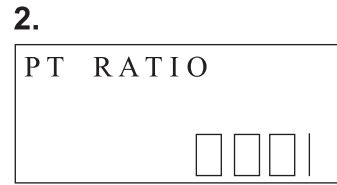
S Function Setting	Button	Range & Instruction of Functions
01 PW	→	Among 3P4W~1P2W~1P3W~3P3W cyclic switch
02 PT	→↑	Show1 PT equals to one multiple (enter 02 condition, press " → " to display)
03 U-unit	→	Unit mark of "V" , "KV" will vary.
04 U-dot	→	The decimal of first V line will vary.
05 CT	→↑	Show 1 CT equals to one multiple (enter 05 condition ' press " →" to display)
06 A-dot	→	The decimal of second A line will vary
07 W-unit	→	Unit mark of "KW" - "MW" , "KVar" - "MVar" will vary.
08 W-dot	→	The decimal of second & third W, Q line will vary.
09 Special function	→↑	00-99 press "D" again to enter below function.
06 Baud	→	Baud among 9600-19200-38400 -1200-2400-4800 cyclic switch.
07 Address	→↑	Modbus conventional address 1~254 (99 is for factory testing)
15 History data saving interval time	→↑	History data set 2-999 minutes per interval to save data. Save one-hour, set to 060 minutes.
16 Set time	→↑	Calibrate present time
17 Set demand interval time	→↑	Set basic time (1-60 min)
18 Set demand W / VA	→	Select demand unit as V A or W
19 Clear printing data	→↑	Key in password
25 Set target demand	→↑	0 ~ 9999
26 Set maximum demand	→↑	0 ~ 9999
28 Clear maximum demand	→↑ D	Key in correct password, enter D to clean history maximum demand and occurred time.
50 Alarm Function		Please see alarm function setting description
51 Alarm / Demand Control	→↑ D	Press "D" to assure, "S" to cancel setting, " → or ↑ " to change setting. N/DE need to save.
52 Harmonic ODD/ALL select	→	Select ODD / ALL accounting
60 Analogy Output Setting	→↑	Analogy output setting
87 Change password	→↑	Key in old password and new codes twice (except zero)
99 Save altered data	→↑ D	Key in correct password to save
43 Auto cross pages	→↑	Auto cross pages per 5 seconds
44 Print	→↑	To print

Ps : 09-16 and 09-28 functions need to be set personally. Inner setting password is 88 (password alterable)

3.2 First operate S to enter into setting statute, 00 (display) winks ' then press D to enter 01 function, afterward perform D' and pictures are shown as follows :



Operate →, 1§2 W , 1§3 W , 3§3 W , 3§4 W are selectable.



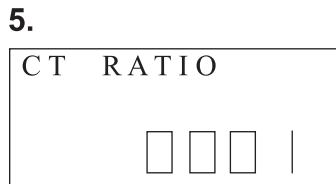
Operate →, twinkling digit, ↑ (change its digit value)



Operate →, to select V or K V



Operate →, to select the position of radix point.



Operate →, twinkling digit, ↑ (change its digit value)



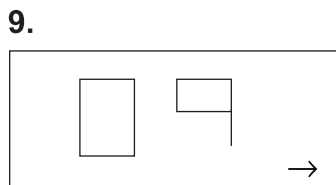
Operate →, select the position of radix point.



Operate →, select KW, MW or Q. Change in-phase.



Operate →, select the radix point W, Var, WH, VarH. Change in-phase.

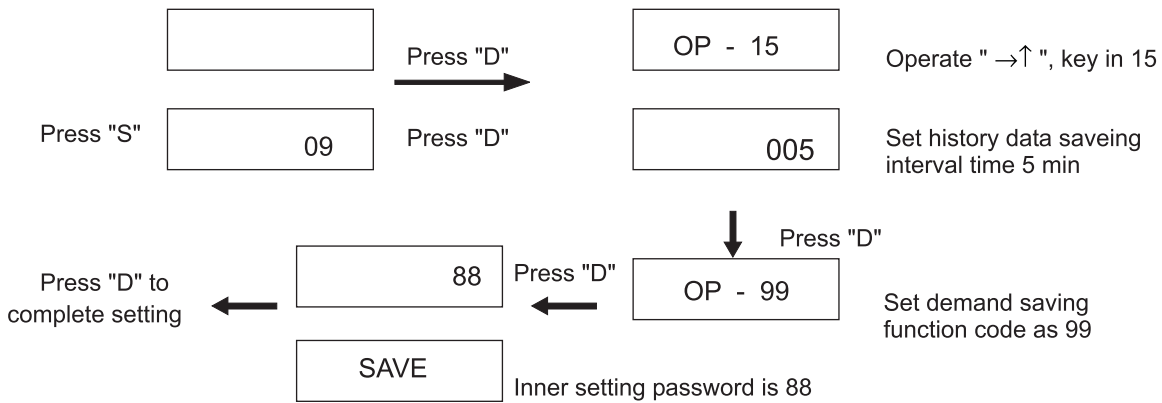


Press D to enter special function.

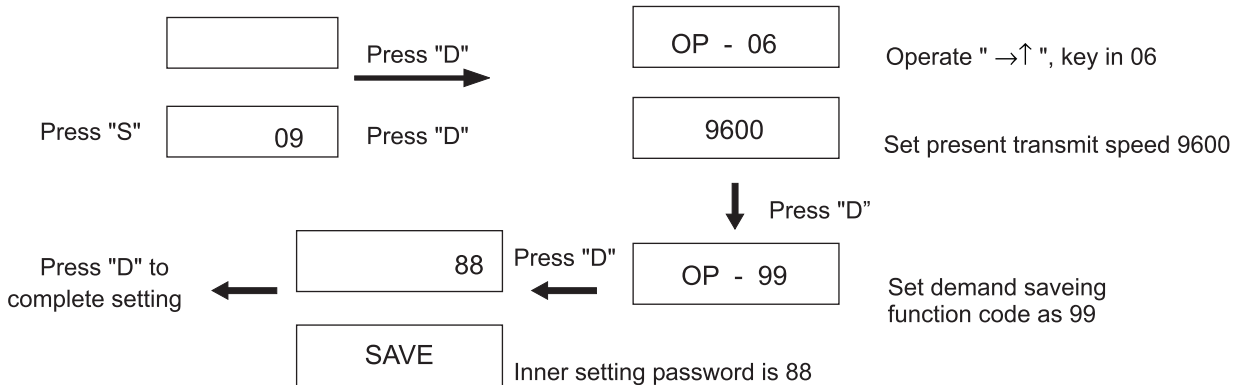
3.3 Example Other 09 Functions Description : press "S" (after entering 09 Function), and then press "D".

Operate "→↑", adjust display to 06, operate "D" again, display present BAUD, operate "→↑", select speed value and save.
 Operate "→↑", adjust display to 07, operate "D" again, display present address, operate "→", select address 01 ~ 254 and save.
 Operate "→↑", adjust display to 15, operate "D" again, show change of history data saving interval time display, key in history data saving interval time and press "D".
 Operate "→↑", adjust display to 16, operate "D" again, show change of present time display, key in present time and press "D".
 Operate "→↑", adjust display to 87, operate "D" again, show change display, key in old password and the same new password twice.
 Operate "→↑", adjust display to 99, operate "D" again. Key in password, then press "D" to save 01 ~ 08 and 15 · 16 · 87 setting function of 09 Functions.

3.3.1 Press →, enter basic display

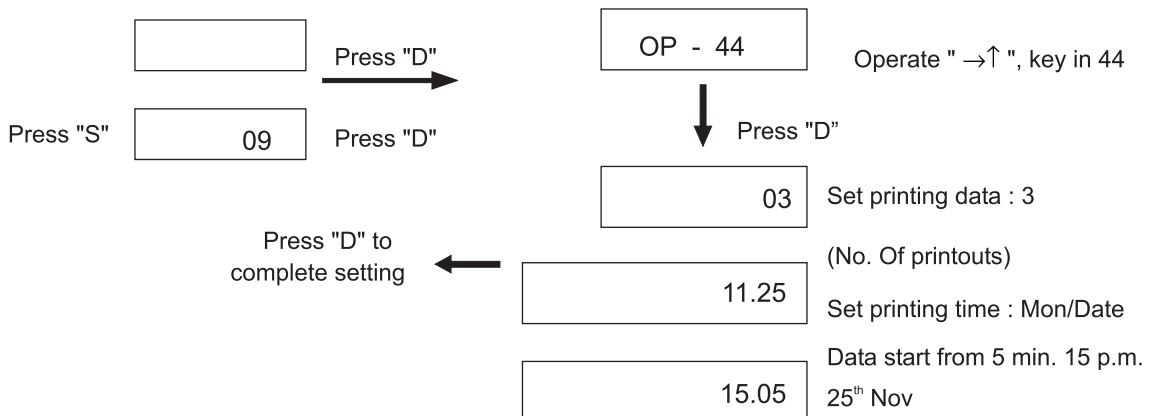


3.3.2 Press →, enter basic display

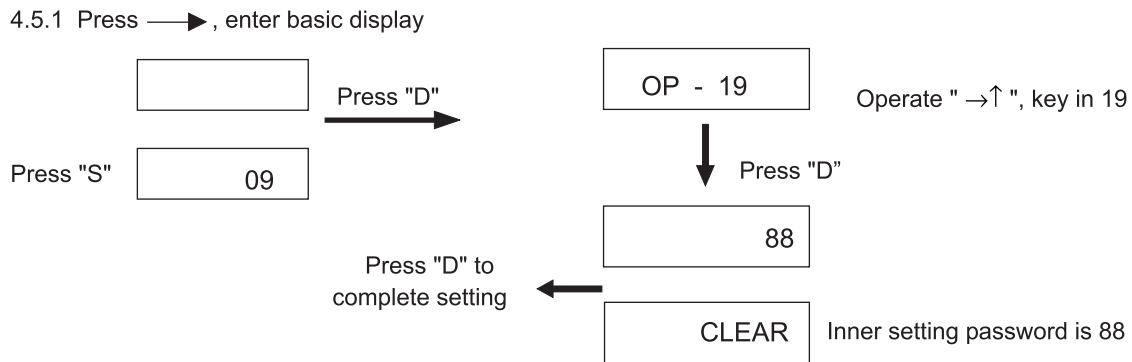


4. Printing Function (Optional) :

4.1 Press →, enter basic display



- 4.2 Press print button to show above display, press “S” to move out and won’t print, press “D” start printing from setting hour 1~999.
- 4.3 Use present time as basis to search data source and find the first qualified data (regardless of time resetting problem) to print, if data undiscoverable won’t print.
- 4.4 Electricity shutdown during operation, history data can’t save or print, or data undiscoverable won’t print.
- 4.5 Other 09 Functions Discription : press “S” (after entering 09 Function), and then press “D”.
Operate "→↑", , adjust display to 19, then press “D”, show clear saved data display. Key in correct password, press “D” to clear.



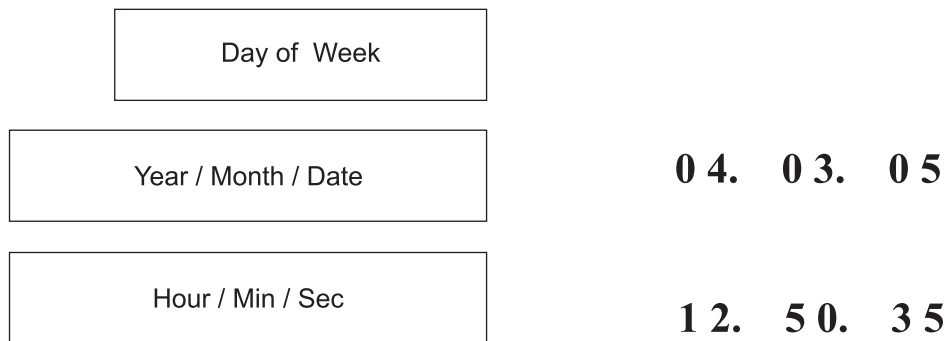
4.6 Printing Data Form :

Month - Day Hour : Min
 V=11.00 11.00 11.00KV
 A=5.000 5.000 5.000A
 W=999.9KW Q=000.0KW
 PF=0.999 + WH=999999.9KW

Printing Specifications :

1. Use EPSON microprocessor instruction code
2. RS-232 communication
3. ASS II word type.
4. Print 24 or more letters each line. Paper 48mm width.
5. Clearness over 8 dots / mm.
6. High speed printing 62 mm / sec.

6. Time Setting :



Example Time sets to Friday, Mar 5th 2004, 12:50 a.m. 35 sec.:

Press "S", enter 09 function, operate " →↑ ", key in 16, operate "D", shows time setting display, operate " →↑ " again, adjust display as above : 5 in the first row means Friday, second row means year/month/date ' third row means hour/min/sec.

7. Analogy Output (Optional) :

Analogy output answer value (The data is real input value, **no relation with PT, CT setting.**

Within 3 phase 4 wire, voltage value below is phase voltage):

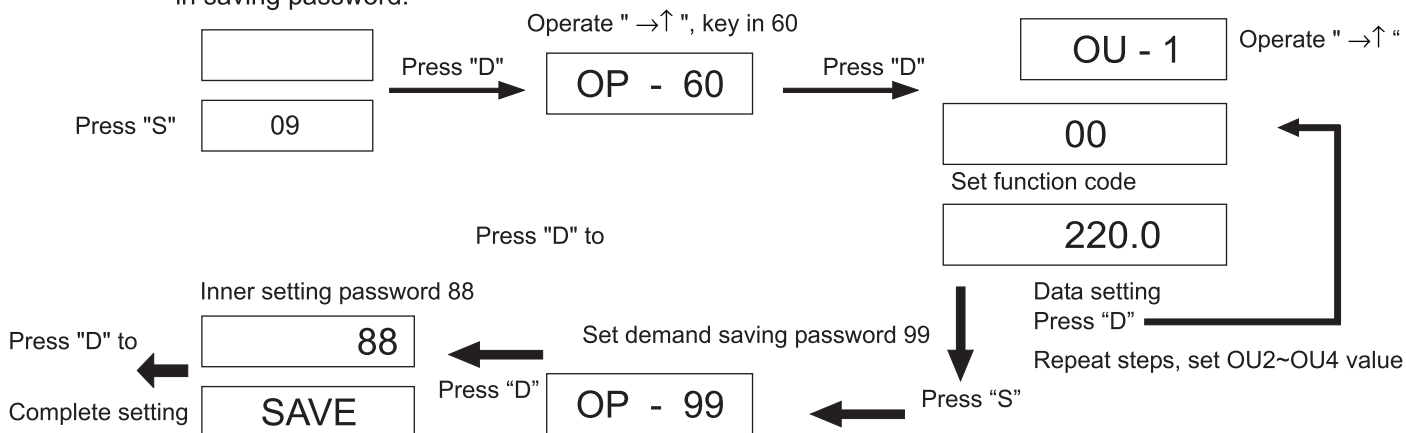
Example 1 : When RV 0~220V answers to 4~20mA

Inner setting 60 of Function 09, analogy output function specification : (Set 1~Set 4 analogy output setting)

Press "S", enter 09 function, operate " →↑ ", key in 60, operate "D" to show alarm setting display:

1. Operate "D" on the "OU-1" panel again, operate " →↑ ", to adjust display as follows.
2. Function code, operate " ↑ → ", adjust display to 0 0 condition. ® phase voltage)
3. Setting value file, operate " ↑ → ", adjust display to 2 2 0 0 condition. (Answer to 20mA)

Press "S", move out to 0 9 function, operate " →↑ ", key in 99, operate "D" to enter and key in saving password.



Function CODE	NAME	REMARK
00	RV	R Phase Voltage
01	SV	S Phase Voltage
02	TV	T Phase Voltage
03	RA	R Phase Current
04	SA	S Phase Current
05	TA	T Phase Current
06	W	Watt
07	Q	Var
08	PF	Power Factor
09	Freq	Frequency (50-5, 50-2, 50-1, 60-5, 60-2, 60-1)
10	Present Demand	Present Demand
11	Historical Max Demand	Historical Max Demand
10	Forecast Demand	Demand Forecast

Example 2. RA: 0~2.5A answer to 4~20mA

Inner setting 60 of Function 09, analogy output function specification: (Set 1~Set 4 analogy output setting)

Press “S”, enter 0 9 function, operate "→ ↑", key in 60, operate “D” to show alarm setting display :

1. Operate “D” on the “OU-2” panel again, operate "→ ↑" to adjust display as follows.
2. Function code, operate "↑ →", adjust display to 0 3 condition. (R phase current)
3. Setting value file, operate "↑ →", adjust display to 2 5 0 0 condition. (Answer to 20mA)

Press “S”, move out to 0 9 function, operate "→ ↑", key in 99, operate “D” to enter and key in saving password.

<u>OU-2</u>	<u>03</u>
Analogy output Set 2	Function Code
<u>2.500</u>	
Data setting	

Example 3. PF: -0.5~1~0.5COS θ answer to 4~20mA

Inner setting 60 of Function 09, analogy output function specification: (Set 1~Set 4 analogy output setting)

Press “S”, enter 0 9 function, operate "→ ↑", key in 60, operate “D” to show alarm setting display :

1. Operate “D” on the “OU-3” panel again, operate "→ ↑" to adjust display as follows.
2. Function code, operate "↑ →", adjust display to 0 8 condition. (PF)
3. Setting value file, show PF display condition. Inner setting value is -0.5 ~ 1 + 0.5 COS θ answer to 4~12~20mA
operate "↑ →", adjust display to 2 5 0 0 condition. (Answer to 20mA)

<u>OU-3</u>	<u>08</u>
Analogy output Set 3	Function Code
<u>PF</u>	
Data setting	

Example 4. Frequency : 60± 5Hz answer to 4~20mA; (50-5, 50-2, 50-1, 60-5, 60-2, 60-1) / 4~20 mA Selectable

Inner setting 60 of Function 09, analogy output function specification: (Set 1~Set 4 analogy output setting)

Press “S”, enter 0 9 function, operate "→ ↑", key in 60, operate “D” to show alarm setting display :

1. Operate “D” on the “OU-4” panel again, operate "→ ↑" to adjust display as follows.
2. Function code, operate "↑ →", adjust display to 0 9 condition. (Frequency)
3. Setting value file, operate "↑ →", adjust display to 60-5 condition. (55~60~65 answer to 4~12~20mA)

Press “S”, move out to 0 9 function, operate "→ ↑", key in 99, operate “D” to enter and key in saving password.

<u>OU-4</u>	<u>09</u>
Analogy output Set 4	Function Code
<u>60-5</u>	
Data setting	

Example 5. Q : -1.650~0~+1.650Var answer to 4~12~20mA

Inner setting 60 of Function 09, analogy output function specification: (Set 1~Set 4 analogy output setting)

Press “S”, enter 0 9 function, operate "→ ↑", key in 60, operate “D” to show alarm setting display :

1. Operate “D” on the “OU-4” panel again, operate "→ ↑" to adjust display as follows.
2. Function code, operate "↑ →", adjust display to 0 7 condition. (Var)
3. Setting value file, operate "↑ →", adjust display to 1650 condition. (Answer to 20mA)

Press “S”, move out to 0 9 function, operate "→ ↑", key in 99, operate “D” to enter and key in saving password.

<u>OU-4</u>	<u>07</u>
Analogy output Set 4	Function Code
<u>1.650</u>	
Data setting	

8. Communication Function :

8.1 With one unit of RS 485 communication model (terminal 16 positive, terminal 17 negative)

With one unit of RS 232 communication model (terminal is 9 pins, D type connector)

Use ModBus RTU can connect 32 machines.

8.2 MODBUS :

MODBUS-RTU MODE Protocol

BAUD : 1200 . 2400 . 4800 . 9600 . 19200 . 38400 ;

STARTBIT = 1 · DATABITS = 8 · STOPBITS = 1 · PARITYBITS = 0

Master request reading (8 Byte total)				
Address	Function	Start_Address	Point	CRC16
8-Bits	8-Bits	16-Bits	16-Bits	16-Bits (Lo, Hi)
XXH	03H	XXH,XXH	XXH,XXH=N	XXH,XXH

Slaver write back (5+n Byte total)				
Address	Function	Byte_Count	Data	CRC16
8-Bits	8-Bits	16-Bits	Nx 8-Bits	16-Bits (Lo, Hi)
XXH	03H	XXH=N	XXH,XXH,XXH,.....	XXH,XXH

Master request writing (8 Byte total)				
Address	Function	Start_Address	Point	CRC16
8-Bits	8-Bits	16-Bits	16-Bits	16-Bits (Lo, Hi)
XXH	06H	XXH,XXH	XXH,XXH	XXH,XXH

Master request printing saved data reading (8 Byte total)				
Address	Function	Start_Num	Num	CRC16
8-Bits	8-Bits	16-Bits	16-Bits	16-Bits (lo, hi)
XXH	63H	XXH,XXH	XXH,XXH=N	XXH,XXH

Slaver write back Packet (38 Byte total)				
Address	Function	Now_Num	Data	CRC16
8-Bits	8-Bits	16-Bits	32-BYTE	16-Bits (lo, hi)
XXH	63H	XXH,XXH	XXH,XXH,XXH,.....	XXH,XXH

Slaver write back Packet is innumerous ' every packet has 38 BYTES.

Example : DMPW address is 31 ' PC reads address of 31 DMMP, from 100 (64H) start reading to 200 (C8H) data.

PC dispatches 1FH+63H+00H+64H+00H+C8H+CRCL+CRCH

DMPW will revert 1FH+63H+00H+64H+(.....data=32.....)+CRCL+CRCH

1FH+63H+00H+65H+(.....data=32.....)+CRCL+CRCH

·

(Total 200)

·

1FH+63H+01H+2CH+(.....data=32.....)+CRCL+CRCH

UNIT : One Word (Two Byte)

UNIT : One Word (two Byte)

Point	Name	Note	(R:Read ' W:Write)
1	S_V1	R phase voltage (unsigned int)	R
2	S_V2	S phase voltage (unsigned int)	
3	S_V3	T phase voltage (unsigned int)	
4	S_A1	R phase current (unsigned int)	
5	S_A2	S phase current (unsigned int)	
6	S_A3	T phase current (unsigned int)	
7	S_W1	R phase power	
8	S_W2	S phase power	
9	S_W3	T phase power	
10	S_W	W	
11	S_Q	Var	
12	S_Pf	PF	
13	S_Freq	Frequency	
14	WHP	(Long) WH	
15			
16	WHM	(Long) WH (negative)	
17			
18	QHP	(Long) QH	
19			
20	QHM	(Long) QH (negative)	
21			
22	W,V,A Point	W . V . A POINT. $W=W*10^{(b11,b10,b9,b8)}$; $V=V*10^{(b7,b6,b5,b4)}$; $A=A*10^{(b3,b2,b1,b0)}$:	R/W
23	Realy status W, VUnit	BIT7=RY4, BIT6=RY3; BITS5=RY2; BIT4=RY1; Bit2----(1=KV . 0=V) bit1----(1=MW . 0=W) ' bit 0=demand (0=W/1=V*A).	R/W
24	BAUD	BAUD (0=1200 ' 1=2400 ' 2=4800 ' 3=9600 ' 4=19200 ' 5=38400 ; NORMAL 3=9600)	R/W
25	ADDRESS	ADDRESS (0~99 ' NORMAL 50)	R/W
26=1	CT	CT (0~9999)	R/W
27	PT	PT (0~9999)	R/W
28	Mode	(0=3P4W, 1=1P2W, 2=1P3W,3=3P3W ; NORMAL 3P4W)	R/W
29	OV	OV CONTROL FLA : 15_OV1, 14_OV2, 13_OV3, (Phase Voltage) 12_OA1,11_OA2,10_OA3,9_OW1,8_OW2,7_OW3,6_OW,5_OQ,4_OVR, 3_OVS,2_OVT, (wire voltage) 1=ODemPresent, 0_O Demand Forecast	R
30	DA_W_MAX	Reserve (Analogy Output Setting)	R
31	Historical Demand	Max Demand	R
32	Demand Year/Month	Max Demand Time (BCD)	R
33	Demand Day/ Hour		
34	Demand Min/Sec		
35	Target Demand	Target Demand	
36	Max Demand	Rating Max Demand	R/W
37	Demand Forecast	Forecast Demand	R
38	Present Demand	Cumulative Demand	R
39	Demand Time	Demand Interval Time	R/W
40	Print Time	Print Reserve Interval Time	R/W
41	Print W Address		R/W

42	Week	0x00 ' 0x01~0x07	R/W
43	Year / Month	0x00~0x99 ' 0x01~0x12	R/W
44	Day / Hour	0x01~0x31 ' 0x00~0x23	R/W
45	Min / Sec	0x00~0x59 ' 0x00~0x59 Present System Time	R/W
46	VH1	One time voltage harmonics	R
47	VH_ALL	Total voltage harmonic	R
48	VH_PER	Total voltage harmonics percentage	R
49	VH3	Three times voltage harmonics	R
50	VH5	Five times voltage harmonics	R
51	VH7	Seven times voltage harmonics	R
52	VH9	Nine times voltage harmonics	R
53	VH11	Eleven times voltage harmonics	R
54	VH13	Thirteen times voltage harmonics	R
55	VH15	Fifteen times voltage harmonics	R
56	IH1	One times current harmonics	R
57	IH_ALL	Total current harmonics	R
58	IH_PER	Total current harmonics percentage	R
59	IH3	Three times current harmonics	R
60	IH5	Five times current harmonics	R
61	IH7	Seven times current harmonics	R
62	IH9	Nine times current harmonics	R
63	IH11	Eleven times current harmonics	R
64	IH13	Thirteen times current harmonics	R
65	IH15	Fifteen times current harmonics	R
66	S_V1	Total Voltage	R
67	S_A1	Total Current	R
68	VH17	Seventeen times voltage harmonics	R
69	VH19	Nineteen times voltage harmonics	R
70	VH21	Twenty-one times voltage harmonics	R
71	VH23	Twenty-three times voltage harmonics	R
72	VH25	Twenty-five times voltage harmonics	R
73	VH27	Twenty-seven times voltage harmonics	R
74	VH29	Twenty-nine times voltage harmonics	R
75	VH31	Thirty-one times voltage harmonics	R
76	IH17	Seventeen times current harmonics	R
77	IH19	Nineteen times current harmonics	R
78	IH21	Twenty-one times current harmonics	R
79	IH23	Twenty-three times current harmonics	R
80	IH25	Twenty-five times current harmonics	R
81	IH27	Twenty-seven times current harmonics	R
82	IH29	Twenty-nine times current harmonics	R
83	IH31	Thirty-one times current harmonics	R

Example :

DS_V1=inbuff [adr_v1]*256+inbuff [adr_v1+1];

WHP=inbuff [adr_whp]*256+inbuff [adr_whp +1]+(inbuff [adr_whp+2]*256+inbuff [adr_whp+3])*65536;

RS-485 Modbus

Address 12 S-PF 65038 ~~~~~ 64539 | 999 ~~~~ 500
 Power Factor Value -500 (C) ~~~ -999 | 999 ~~~~~ +500 (L)
 Power Factor (L) displays directly.
 When Power Factor (C), 65538 - Address 12 S-PF = Power Factor value.
 Example : Present PF = -0.800 , 65538 - 800 = 64738 (Address 12 S-PF)
 Meaning :
 When Address 12 S-PF value > 60000, Power Factor is negative (C)
 Power Factor value = 65538 - obtained value (Address 12 S-PF)
 When Address 12 S-PF value < 2000
 Power Factor value = obtained value (Address 12 S-PF)
 Var obtained value is indicative value, Power Factor judges (C) or (L).

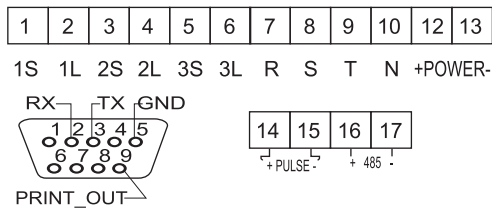
9. Example :

Key in 3 ϕ 3W 3.3KV/110V, 40/5A (PT=30 multiple, CT=8 multiple)
 Indicate 3.300KV 0~40.00A 0~240.0KW (KVar) :
 Press "S", enter 01 select file, press "D" again, operate " → ", adjust display to 3 3W condition.
 Press "S" or "D", enter 02 PT multiple file, press "D", again, operate " → ↑ ", adjust PT multiple to 30 multiple condition.
 Press "S" or "D", enter 03 voltage unit file, press "D", operate " → ", adjust voltage unit to KV condition.
 Press "S" or "D", enter 04 voltage decimal file, press "D", operate " → ", adjust voltage decimal to 0.000KV condition.
 Press "S" or "D", enter 05 CT multiple file, press "D", operate " → ↑ ", adjust CT multiple to 8 multiple condition.
 Press "S" or "D", enter 06 current decimal, press "D" again, operate " → ", adjust current decimal to 00.00A condition.
 Press "S" or "D", enter 07 watt unit selection, press "D" again, operate " → ", adjust display unit to KW, Kvar, KWH, KvarH condition.
 Press "S" or "D", enter 08 watt decimal file, press "D" again, operate " → ", adjust decimal to 000.0KW, Kvar, KWH, KvarH condition.
 Press "S" or "D", enter 09 Save, operate " → ↑ " adjust display to 88, then operate "D", display save, key in password, Press "D" to save.

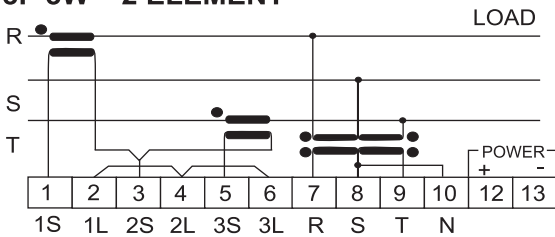
Connection Diagram :

WARNING

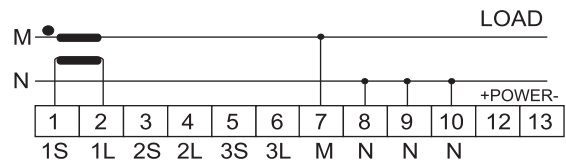
TO AVOID ELECTRIC SHOCK PLEASE.
 NO OPERATOR SERVICEABLE
 COMPONENTS INSIDE. DO NOT REMOVE COVERS.
 REFER SERVICING TO QUALIFIED PERSONNEL.



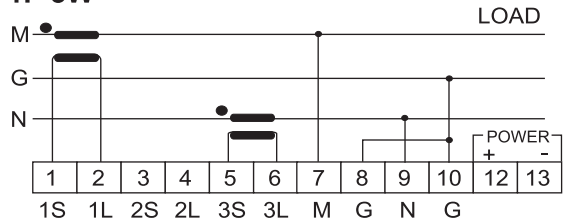
3P 3W 2 ELEMENT



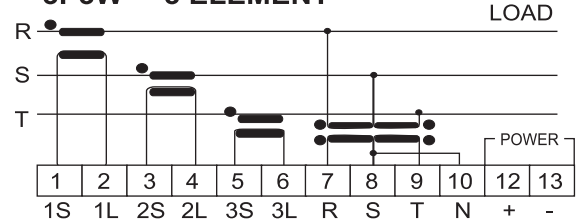
1P 2W



1P 3W



3P3W 3 ELEMENT



3P4W 3 ELEMENT

