KUSAM-MECO®

An ISO 9001:2008 Company

DIGITAL MICROPROCESSOR TRMS MAXIMUM DEMAND CONTROLLER

Model KM 7200 B

UNIQUE FEATURES :

3 Displays at one time : 3 V, 3 A, W, Var, WH, VarH, PF, H z (12 parameters)

Applicable Standard : DIN IEC 688

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

User friendly setting of Demand parameters :

Demand Time interval setting (0 - 60 minutes)

Synchronising time with Electricity Board meter timing

Maximum Demand (Sanctioned Demand) & Target Demand Setting.

Displays Demand forecast

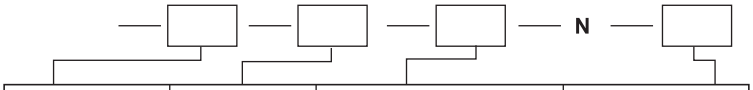
Displays remaining time interval (of the demanding period)

Displays Present Demand

Displays usable remaining Demand.

Software for Load & Demand Analysis (optional)

Model KM 7200 B

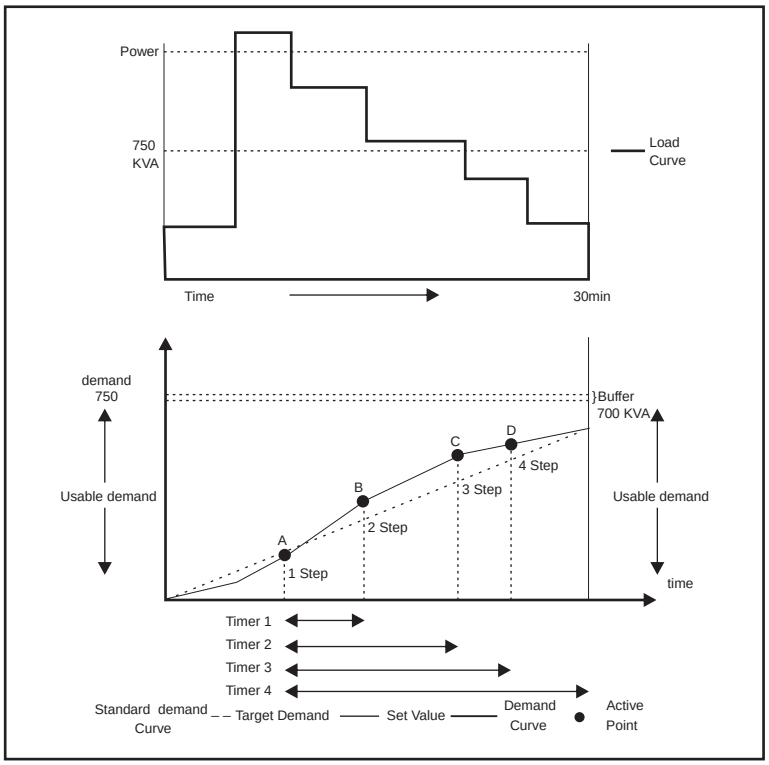


INPUT(V)		INPUT(C)		OUTPUT		AUX. POWER	
A	55 ~ 300V	A	1A	F	RS485 Modbus	C	DC 24V
				O	4 Units Analog	F	AC 85 ~ 265V
				M	4 Units Analog + RS485		DC 100 ~ 300V
B	300 ~ 600V	B	5A	Q	Full Function		
				N	NONE		
Y	SPECIAL	Y	SPECIAL	Y	SPECIAL	Y	SPECIAL

In 3 φ 4 ω system Voltage (INPUT (V) is Line - Neutral Voltage

When ordering specify Model code number - input V - Input C - Output - Power (e.g.KM - 7200 B - B - B - F - N - F)

MAXIMUM DEMAND CONTROLLER GRAPH



SPECIFICATIONS :

INPUT :

Input Voltage Range : Normal Voltage 110 V,
Effective Range 85 ~ 150 V. AC
Normal Voltage 220V,
Effective Range 160 ~ 300 V AC

Input Voltage Over Range : Normal AC 110 V,
Voltage Over 500 V Continuous.

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,
Current Over 15 A Continuous.

Input Frequency : 45 Hz ~ 70 H z.

Input Burden : Voltage 0.25 VA / Unit,
Current 0.25 VA / Unit, at 50 / 60 H z

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.

Display Range : V, A, W, Var, PF, H z, 0.56" Super RED LED
4 Digits = 0 ~ 9999 Counts PT,
CT Ratio User Selectable.
WH; VarH, 0.56" Super RED LED,
6 Digits = 0 ~ 999999 Counts.

Response Time : 1 Sec.

Dielectric Strength : AC 2.8 KV / 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.

All Specifications are subject to change without prior notice

HOW THE MAXIMUM DEMAND CONTROLLER SAVES PENALTY

MODEL KM 7200 B

OUTPUT :

In this Instrument there are 4 Relay outputs for Demand Control : In this instrument we can set the TARGET DEMAND (approx. 10%) below the SANCTIONED demand. When the present demand exceeds the target demand, the relay Output switches ON. These relay outputs can be connected to least priority loads. When the relay turns on , the loads are switched off. When the present demand falls below the target demand, the relay switches ON the loads one by one. Delay time can be set for the relay control. Thus the present demand never exceeds the sanctioned demand & the customer is saved from paying penalty. This instrument also displays the remaining usable Demand, so that the load schedule can be programmed accordingly.

DEMAND MANAGEMENT & DEMAND CONTROL : THE MAXIMUM DEMAND CONTROLLER indicates MAXIMUM DEMAND (SANCTIONED), TARGET DEMAND, PRESENT DEMAND, DEMAND FORECAST & REMAINING USABLE DEMAND & REMAINING TIME DURING ONE CYCLE. THESE FEATURES ARE MOST ESSENTIAL FOR PROPER DEMAND MANAGEMENT.

MAXIMUM DEMAND : It is the Maximum Demand value which is sanctioned by the Electric supply Company at the time of application for sanction of load.
E.g.1000 K VA.

TARGET DEMAND : It is the Maximum Demand value which we do not want to exceed. If there is no power cut, Target Demand is equal to Maximum Demand e.g. If there is 25 % power cut then Target Demand will be 750 KVA if Maximum Demand is 1000 K VA.

PRESENT DEMAND : It is zero at the beginning of the demand interval and increases as the load increases within the time interval of the demand period (= 30 minutes). At the end of this period it returns to zero.

DEMAND FORECAST : According to the variation in the connected load this display will indicate the Maximum Demand which will be reached at the end of demand period (= 30 minutes). This will allow the user to plan the load pattern in accordance with the demand forecast , so as to avoid exceeding the Target Demand.

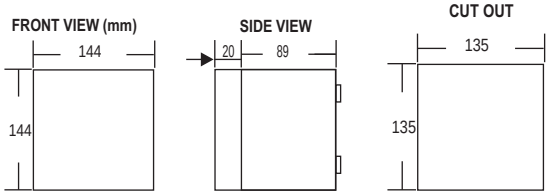
USEABLE REMAINING DEMAND : According to the Current Maximum Demand (connected load) the Demand Controller will calculate the Usable Demand which can be used by the consumer in the remaining demand period (= 30 minutes - time elapsed) such that the Maximum Demand is within the Target demand Value. E.g. if the target demand is set at 750 KVA and the demand period = 30 minutes, then at the beginning, the useable demand = 750 KVA & the time display = 30 minutes. If the load is 1200 KVA at the beginning (more than the Maximum Demand and Target Demand), then the usable demand shall get reduced from 750 KVA, in the remaining time. 10 Minutes later ,if the load is not changed , if the useable demand displays 600 KVA, and the remaining time displays 20 minutes , it means that the useable demand in the next 20 minutes left is 600 KVA. If the current load is not reduced from 1200 KVA to 600 KVA, then there is a risk of exceeding the Target Demand 20 minutes later. Therefore current load must be reduced so as to reduce the KVA.

On the contrary if the load is less than 750 KVA in the beginning, then the usable remaining demand shall increase. If the usable demand displays 1000 KVA and the remaining time displays 10 minutes and the current load is 600 KVA, it means that 400 KVA more load can be connected for the remaining 10 minutes. The user can self arrange or adjust the load in accordance with the above explanation, so that the user does not exceed the Target Demand.

MAXIMUM DEMAND REPORT OF OCTOBER (Sample Reports) Date : 1 - 10 - 09 Time 9.02am

RECORD	KW	KVA	KVAR	TIME
1	1.04	0.84	0.91	9.02
2	1.05	0.85	0.92	9.05
3	1.09	0.89	0.96	9.20
4	1.11	0.91	0.98	9.27
5	1.23	1.03	1.1	9.43

DIMENSION :



All Specifications are subject to change without prior notice

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KUSAM-MECO

MULTIFUNCTION POWER METER

OPERATION MANUAL

KUSAM-MECO Microprocessor Multifunction Power Meter MODEL DMPWD-7200-B

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 1ϕ2W; 1ϕ3W; 3ϕ3W; 3ϕ4W.
- Harmonics Analyze Voltage, Current for 31 times, Display for 15 times.
- **10 Years Power-Off Memory for WH & Var**
- 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
				O	4 Units Analog			F	AC 85~265V
				M	4 Units Analog+RS-485				DC 100~300V
C	300 ~ 600V	B	5A	P	Print Function+RS-485				
				Q	Full Function				
				N	NONE	N	NONE		
Y	SPECIAL	Y	SPECIAL	Y	SPECIAL	Y	SPECIAL	Y	SPECIAL

3ϕ 4ω 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,

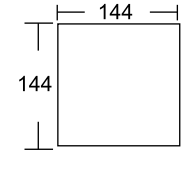
Operation Condition : -10°C ~ +55°C 20 ~ 95% RH Non-Condensed.

Storage Condition : -40°C ~ +75°C 20 ~ 95% RH Non-Condensed.

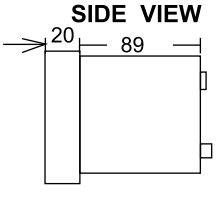
Power Supply : AC 85~265V and DC 100~300V of Power .

Mounting : Panel Flush Mounting.

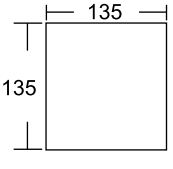
FRONT VIEW (mm)



SIDE VIEW



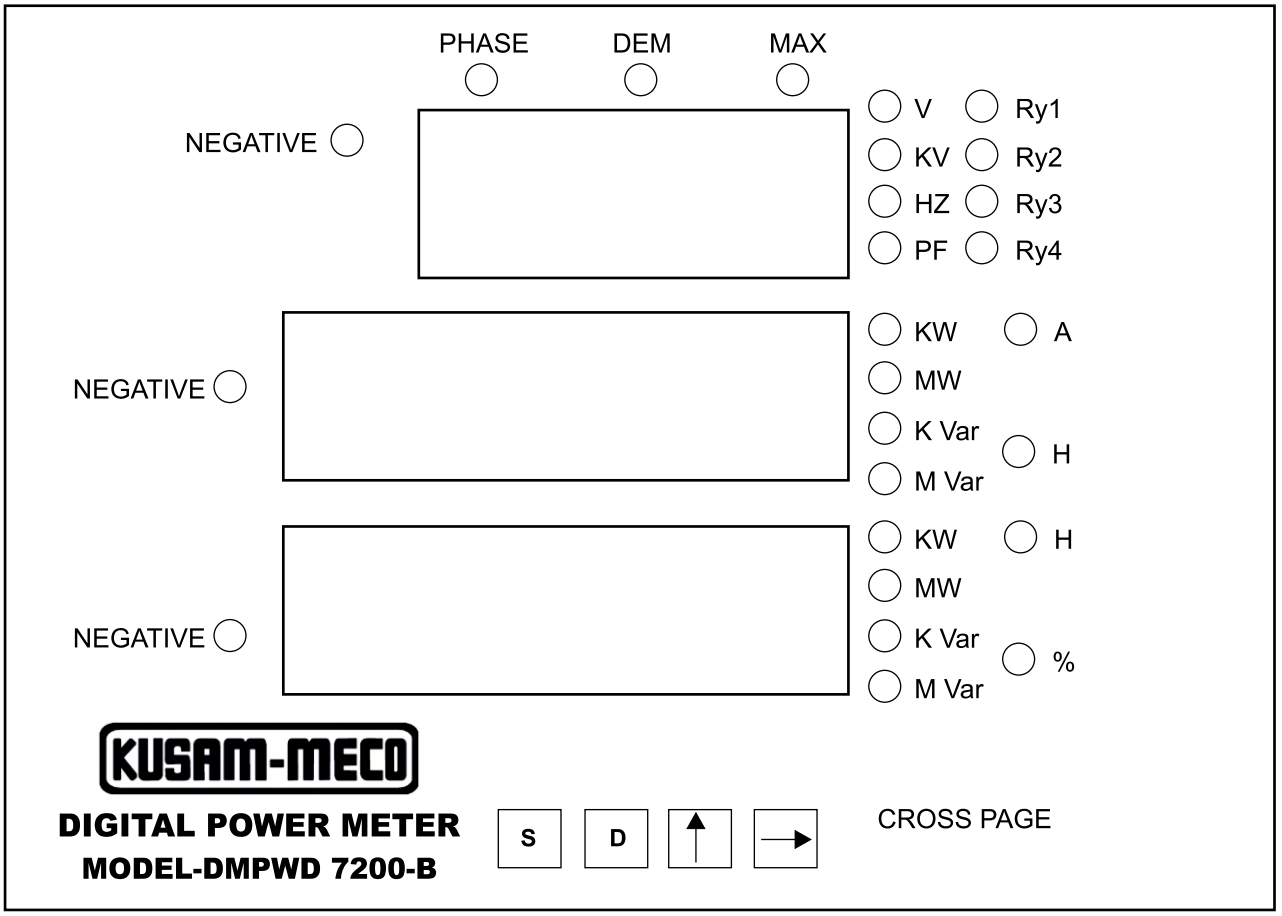
CUT OUT



KUSAM-MECO

MICROPROCESSOR MULTIFUNCTION POWER METER-DMPWD-7200-B

1. Panel Operation :



Function :

S : SELECT BIT
D : DATA

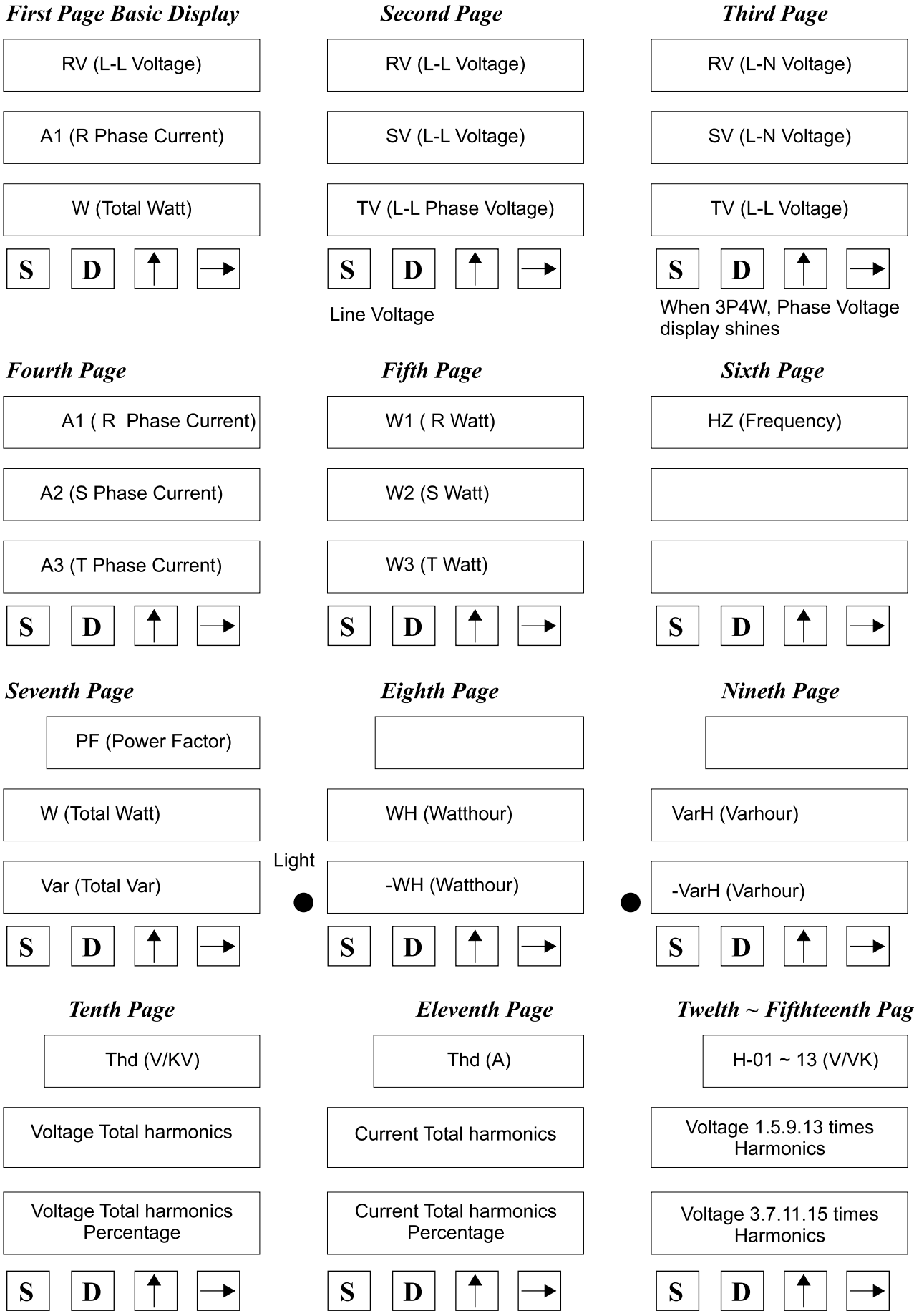
↑ : UP (change number)
→ : RIGHT (shift digit)

"S" Button :

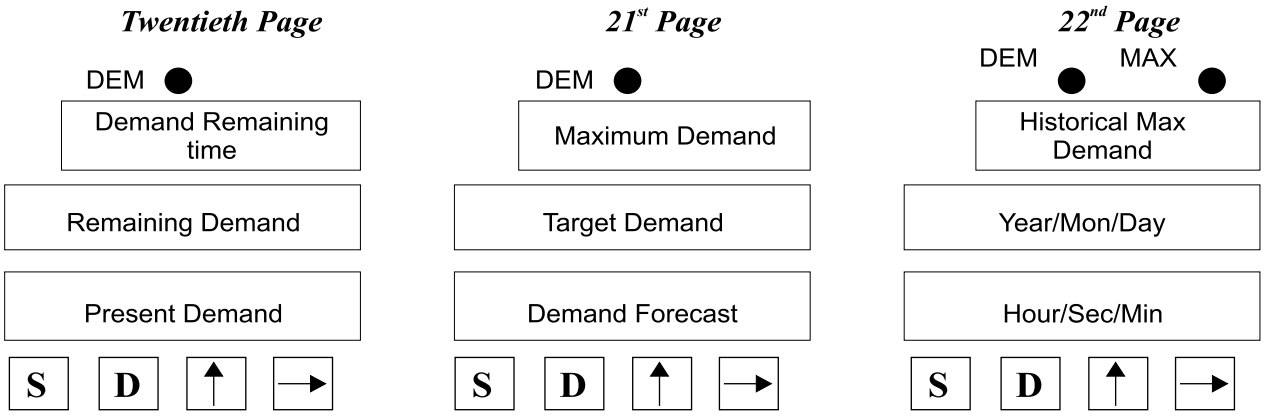
1. **S** (to enter setting mode) ' and display 01 data.
2. **D** (to enter 01 setting function) ' then press D to 02 (setting data).
3. As entering setting value ' perform ↑ and → to change setting value.
4. On mode 01 "Wait", operate **S** to select each function point 01,02,...,09.
5. Or press **D**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



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



3. Number Setting :

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

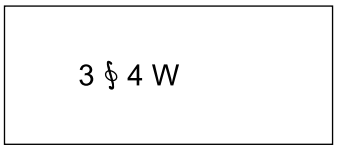
Press "S", enter setting value condition, 01 display shines, then press "D", the screen shows as follows :

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)

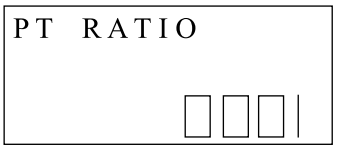
3.2 First operate S to enter into setting statute, 00 (display) winks ' then press D to enter 01 function, afterward perform D' and pictures are shown as follows :

1.



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

2.



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

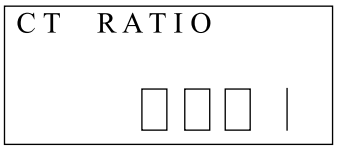
3.

Operate →, to select V or K V

4.

Operate →, to select the
position of radix point.

5.

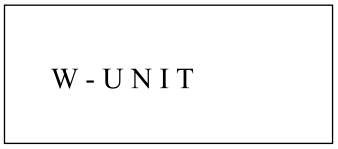


Operate →, twinkling digit,
↑ (change its digit value)

6.

Operate →, select the position
of radix point.

7.

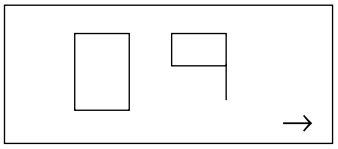


Operate →, select KW, MW
or Q. Change in-phase.

8.

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

9.



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.

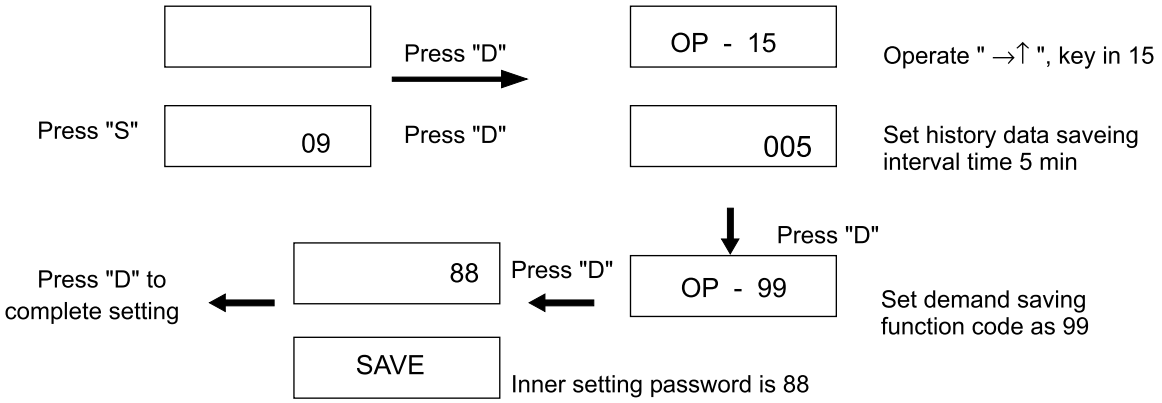
Operate "→↑ ", adjust display to 15, operate "D" again, show change of history data saving interval time display, key in history data saving interval time and press "D".

Operate "→↑ ", adjust display to 16, operate "D" again, show change of present time display, key in present time and press "D".

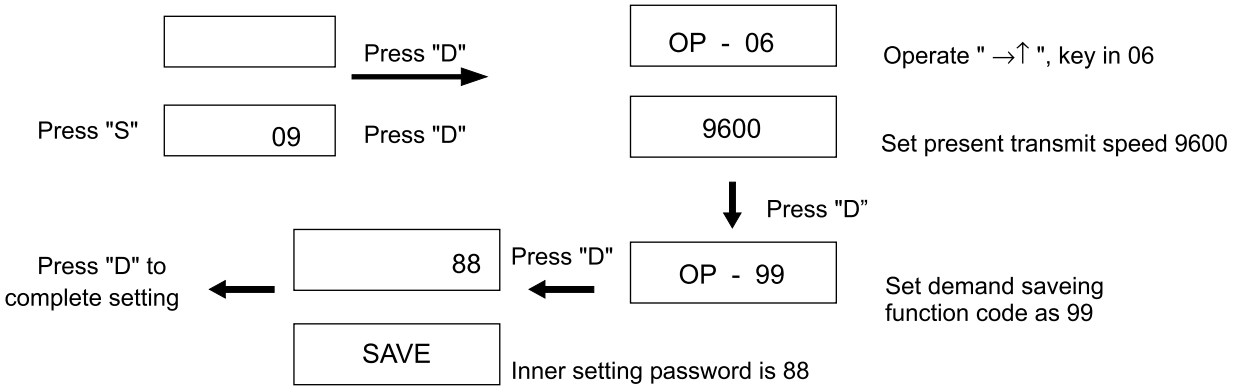
Operate "→↑ ", adjust display to 87, operate "D" again, show change display, key in old password and the same new password twice.

Operate "→↑ ", adjust display to 99, operate "D" again. Key in password, then press "D" to save 01 ~ 08 and 15、16、87 setting fumction of 09 Functions.

3.3.1 Press ⟶, enter basic display

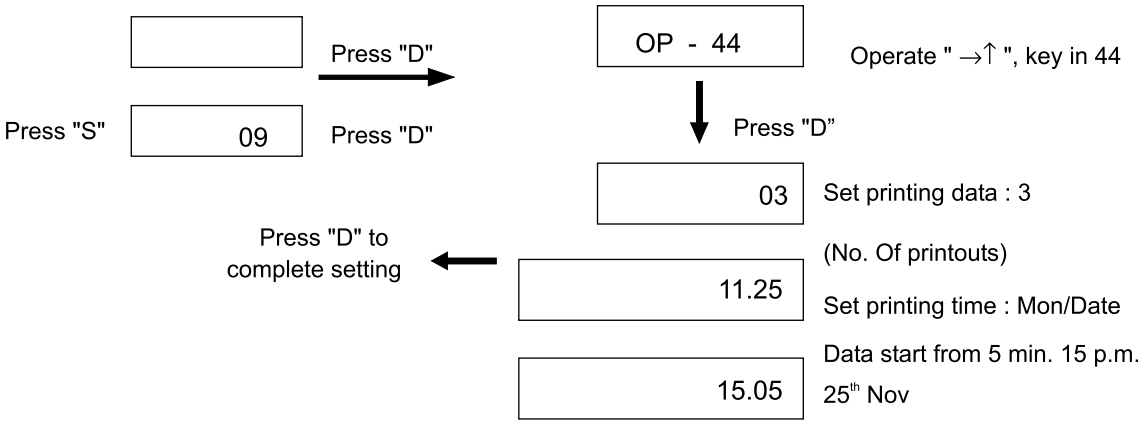


3.3.2 Press ⟶, enter basic display



4. Printing Function (Optional) :

4.1 Press ⟶, enter basic display



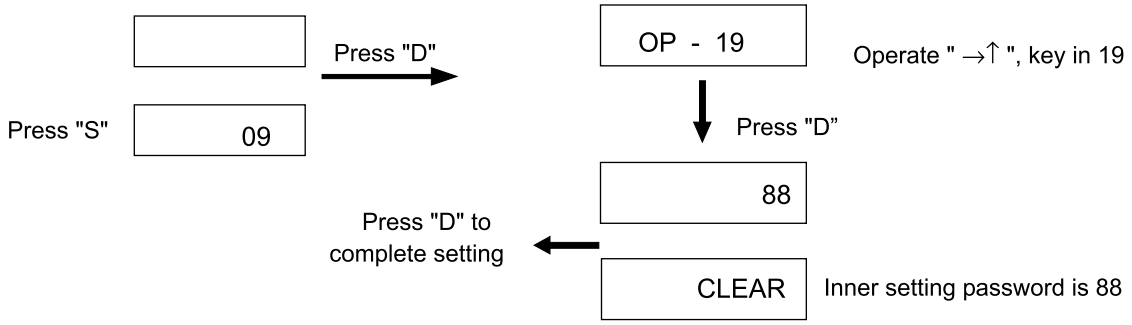
4.2 Press print button to show above display, press “S” to move out and won’t print, press “D” start printing from setting hour 1~999.

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.

4.5.1 Press ⟶▶, enter basic display



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.

5. Alarm Function (function 09-50) (Optional) :

ON Delay Time function code is N ; OFF Delay Time function code is F

Press "S", enter 09 function, operate " →↑ " key in 50, operate "D" to show alarm setting display.

Operate "D" again, panel "RY1" shines, operate " →↑ ", adjust display as below :

1. Time delay moving point : operate " ↑ → ", adjust display to 006 condition.
2. ON Delay Time & OFF Delay Time setting type, operate " ↑ → ", adjust display to F condition.
3. Function code : operate " ↑ → ", adjust display to 00 condition. (R phase voltage)
4. Alarm setting type : operate " ↑ → ", adjust display to H condition.
5. Setting value : operate " ↑ → ", adjust display to 2230 condition.
   Press "S" into 09 function, operate " →↑ ", key in 99, operate "D" to enter. Key in password to save.

006 Time (Seconds) **F** OFF Delay Time **00** Function Code

H State **223.0** Setting Data

6. 223.0 is moving point.

The display means R Phase Voltage is larger than 223.0V alarming movement.

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

Example : Adjust second unit alarm to T Phase Current larger than 4.5A. Delay 24 sec. movement :

024 Time **N** ON Delay Time **05** Function Code

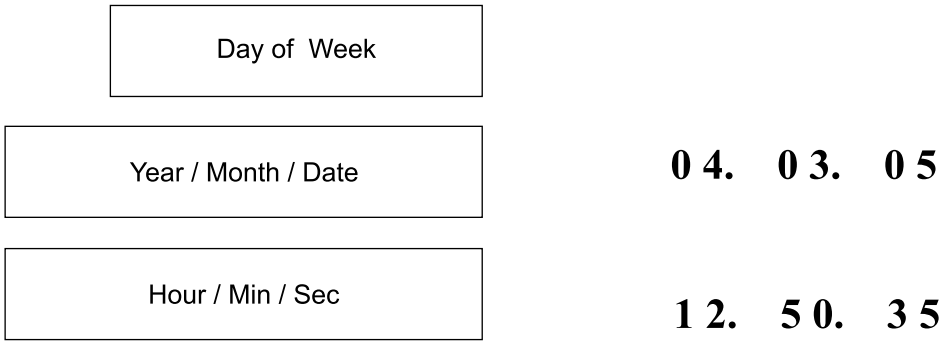
H State **4.500** Data Setting

Press "S", enter 09 function, operate " →↑ " key in 50, operate "D" to show alarm setting display.

Operate "D" again, panel "RY2" shines, operate " →↑ ", adjust display as below.

1. Time delay moving point : operate " ↑ → ", adjust display to 024 condition.
2. ON Delay Time & OFF Delay Time setting type, operate " ↑ → ", adjust display to N condition.
3. Function code : operate " ↑ → ", adjust display to 05 condition. (T phase current)
4. Alarm setting type : operate " ↑ → ", adjust display to H condition.
5. Setting value : operate " ↑ → ", adjust display to 4500 condition.
   Press "S" move out to 09 function, operate " →↑ ", key in 99, operate "D" to enter and key in password to save.

6. Time Setting :



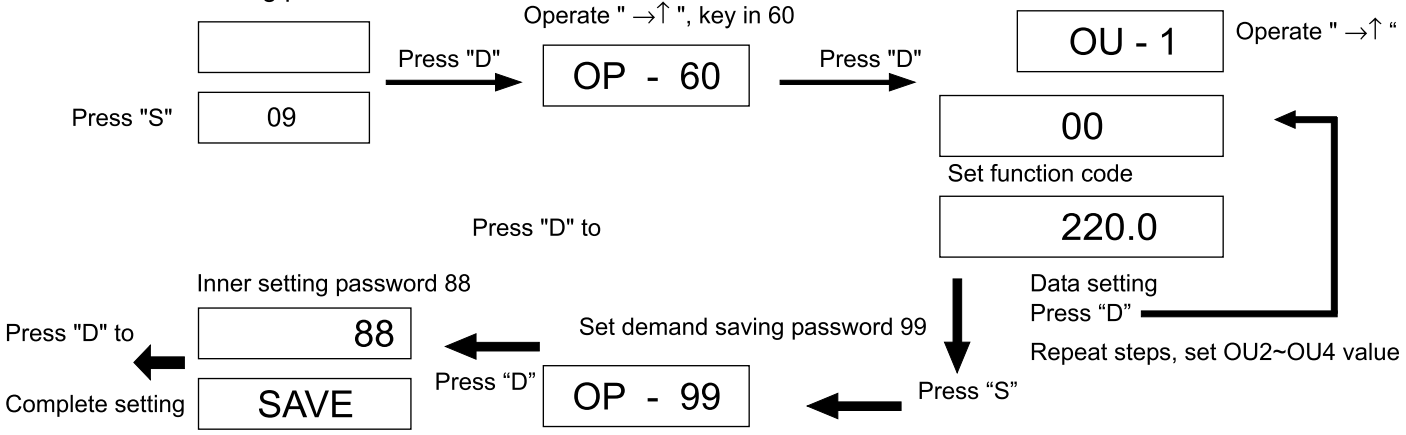
Example Time sets to Friday, Mar 5th 2004, 12:50 a.m. 35 sec.:
Press "S", enter 09 function, operate " →↑ ", key in 16, operate "D", shows time setting display, operate " →↑ " again, adjust display as above : 5 in the first row means Friday, second row means year/month/date ' third row means hour/min/sec.

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.

OU-2 03
Analogy output Set 2 Function Code

2.500
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)

OU-3 08
Analogy output Set 3 Function Code

PF
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.

OU-4 09
Analogy output Set 4 Function Code

60-5
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.

OU-4 07
Analogy output Set 4 Function Code

1.650
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 :

M O D B U S - R T U M O D E P r o t o c o l

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	R
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	Totalvoltage 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	Ninteen 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).

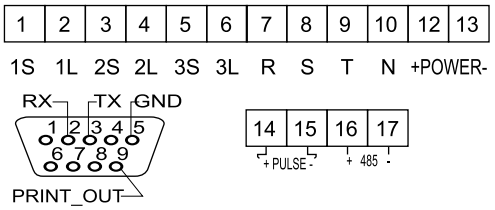
9. Example :

Key in 3Φ3W 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.

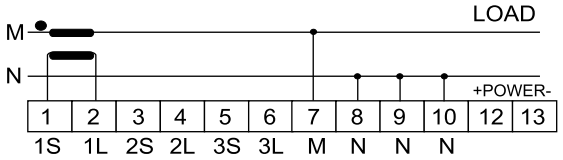
Connection Diagram :

WARNING

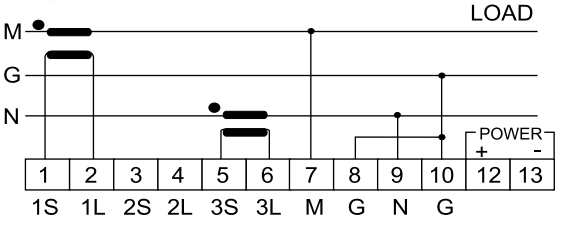
TO AVOID ELECTRIC SHOCKPLEASE.
NO OPERATOR SERVICEABLE
COMPONENTS INSIDE. DO NOT REMOVE COVERS.
REFER SERVICING TO QUALIFIED PERSONNEL.



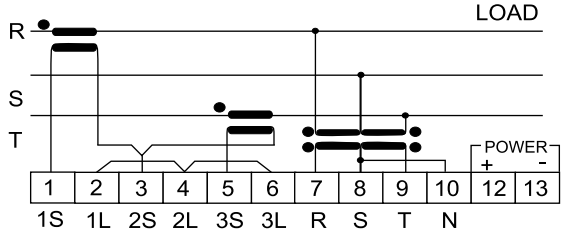
1P 2W



1P 3W

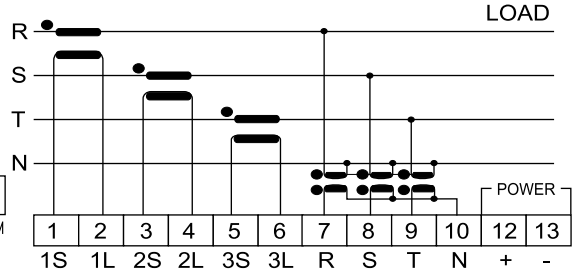


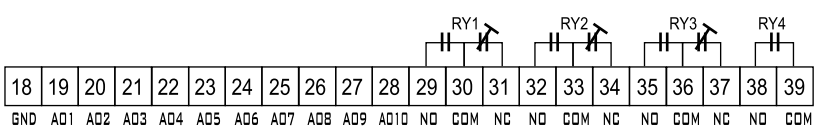
3P 3W 2 ELEMENT



3P3W 3 ELEMENT

3P4W 3 ELEMENT

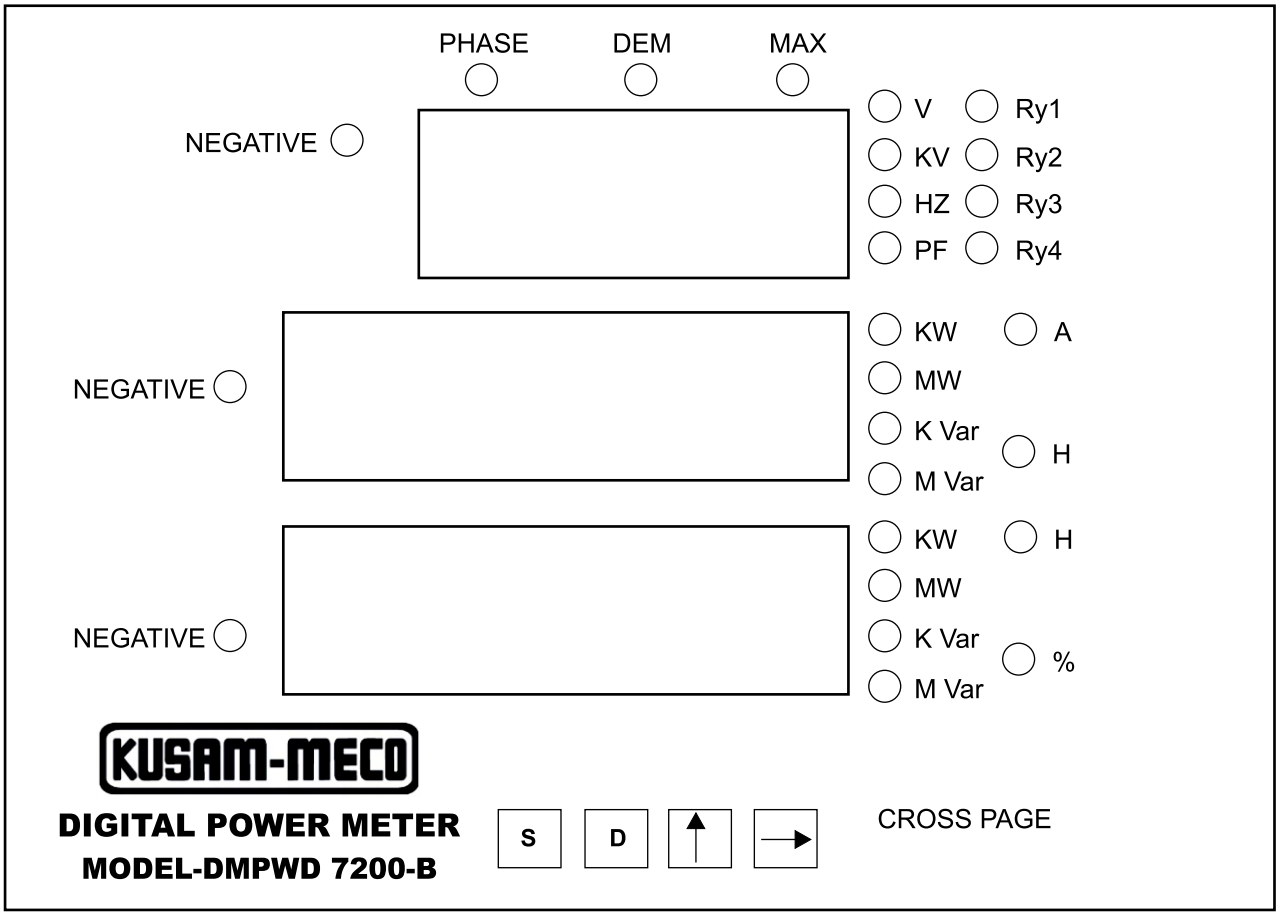




KUSAM-MECO

MICROPROCESSOR MULTIFUNCTION POWER METER
MODEL - DMPWD-7200-B

1. Panel Operation :



Function :

S : SELECT BIT
D : DATA

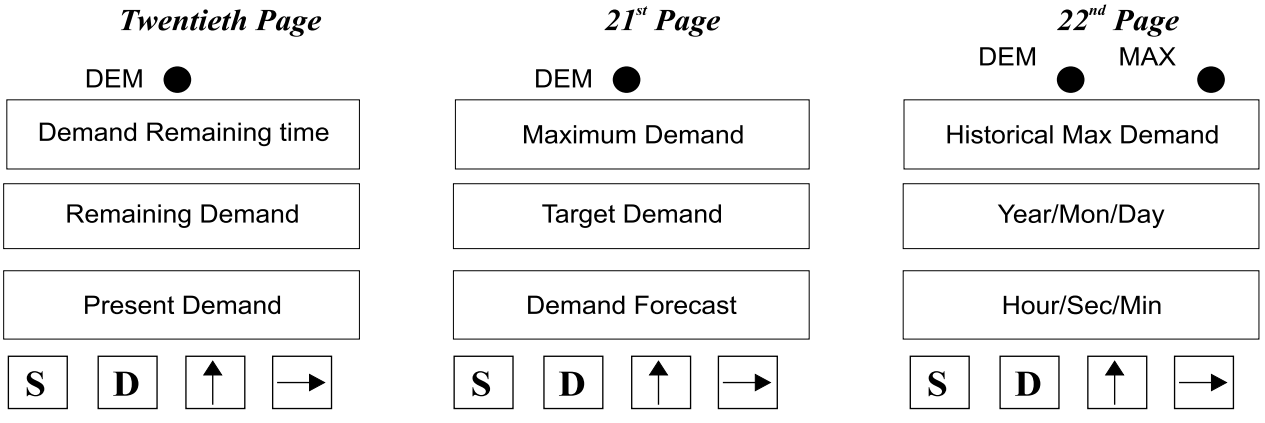
↑ : UP (change number)

→ : 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. Number Setting :

2.1 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.

2.2 Enter ”C” demand display and setting, press " ↑ & → " to change setting value.

Enter setting value condition, 00 shows shines, then press "D", the screen shows as follows :

Function	Button	Range & Instruction of Functions
00 Demand Control (AUTO) / (STOP)	→↑ D	Between demand control (AUTO) / (STOP) function cyclic switch
05 Synchronous setting for time calculation	→↑ D	Synchronous reset cumulative demand
50 Set demand control function	→↑	Please see alarm function setting description
51 Demand control condition (FO) / (Pr)	→↑ D	Select Forecast Demand Control Or Present Demand Control

2.3 During setting, no press within 30 sec, no change.

2.4 During setting, if need to interrupt, press “S” to cancel setting.

2.5 Demand control (AUTO) / (STOP) button and word are shown on demand display.
Enter demand display, press “D”, operate “ →↑ ” , key in 00, press “D” to select (AUTO)/ (STOP), press “D” again.

2.6 No alarm function within demand control.

2.7 Remaining demand below zero, display “**0000**” shines.

3. Rectifying Time :

Rectifying multifunctional meter time to the same with user’s.

Week	
Year/Month/Day	**0 4. 0 3. 0 5**
Hour/Min/Sec	**1 2. 5 0. 3 5**

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.

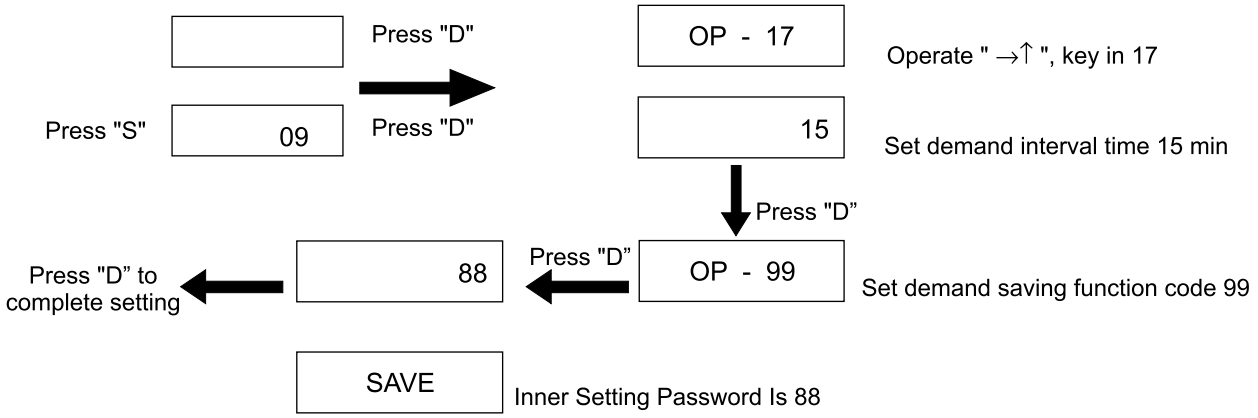
4. Demand Time Setting (Time interval setting for Demand) :

4.1 Other 09 Functions Description : Press “S” (after entering 09 Function), then press “D”

Operate “ →↑ “, adjust display to 17, operate “D” again, show change of setting demand march time display, key in correct demand march time and press “D”.

Operate “ →↑ “, adjust display to 99, operate “D” again to save display, key in password “D” to save.

4.1.1 Press ⟶ , enter basic display



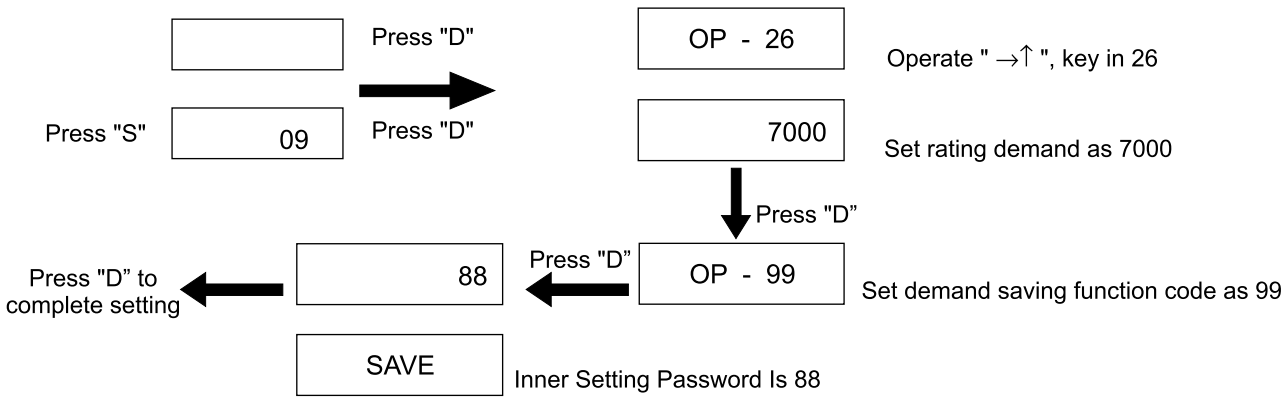
5. Maximum Demand amd Target Demand Setting :

5.1 Other 09 Functions Description : Press "S" (after entering 09 Function), then press "D"

Operate " →↑ ", adjust display to 25, operate "D" again, show change of target demand display , key in correct target demand and press "D".

Operate " →↑ ", adjust display to 26, operate "D" again, show change of rating demand display, key in correct rating demand and press "D".

5.1.1 Press ⟶ , enter basic display

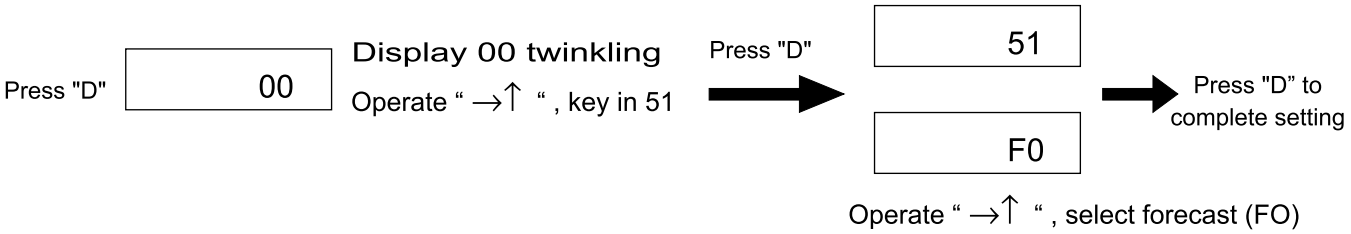


6. Control Model and RELAY (R1~R4) setting

(6.1) Forecast Demand control

(6.1.1) Select Demand Control Mode (Forecast Demand control)

Demand control function under STOP condition can be perform.
Enter demand display, press "D", operate " →↑ " again, key in 51



(6.1.2) RELAY (R1 ~ R4) Setting

Demand control function under STOP condition can be perform.
Enter demand display, press "D", operate " →↑ " again, key in 50

R1 (Unit 1 Relay) Forecast (FO) Demand Control Model
- B. **ON Delay Time Ton1 999 sec.**
- C. **OFF Delay Time Toff1 999 sec.**

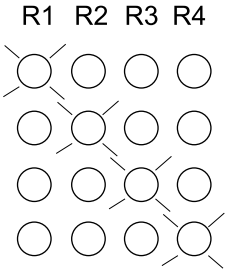
R2 (Unit 2 Relay) Forecast (FO) Demand Control Model
- B. **ON Delay Time Ton2 999 sec.**
- C. **OFF Delay Time Toff2 999 sec.**

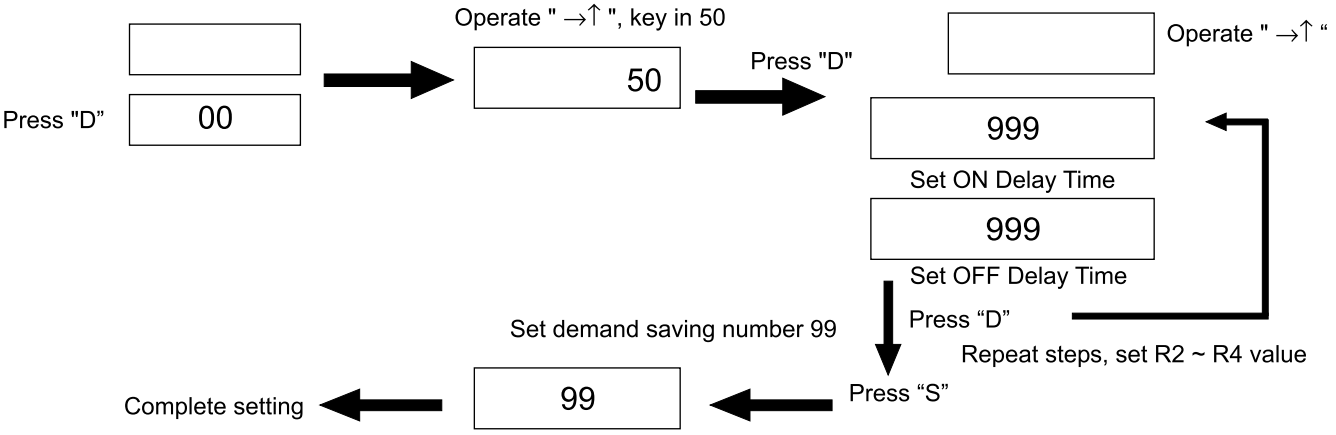
R3 (Unit 3 Relay) Forecast (FO) Demand Control Model
- B. **ON Delay Time Ton3 999 sec.**
- C. **OFF Delay Time Toff3 999 sec.**

R4 (Unit 4 Relay) Forecast (FO) Demand Control Model
- B. **ON Delay Time Ton4 999 sec.**
- C. **OFF Delay Time Toff4 999 sec.**

Press ⟶ , enter demand display

Set R1 (Unit 1 Relay) ~ R4 (Unit 4 Relay)
Set R1 (Unit 1 Relay) ~ R1 shines.
Set R2 (Unit 2 Relay) ~ R2 shines.
Set R3 (Unit 3 Relay) ~ R3 shines.
Set R4 (Unit 4 Relay) ~ R4 shines.



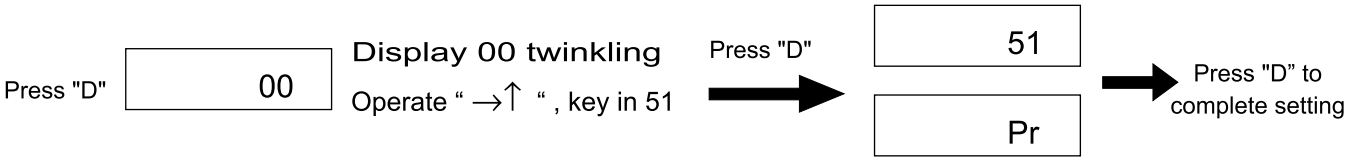


(6.2) Present Demand control

(6.2.2) Select Demand Control Mode (Present Demand control)

Demand control function under STOP condition can be perform.

Enter demand display, press "D", operate " →↑ " again, key in 51



(6.2.2) RELAY (R1 ~ R4) Setting

Demand control function under STOP condition can be perform.

Enter demand display, press "D", operate " →↑ " again, key in 50

R1 (Unit 1 Relay) A. Demand setting value (Pr) (9999 digits, unit mark of KW & VA display the same with basic's)
B. **ON Delay Time Ton1 999 sec.**
C. **OFF Delay Time Toff1 999 sec.**

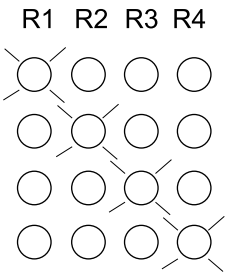
R2 (Unit 2 Relay) A. Demand setting value (Pr) (9999 digits, unit mark of KW & VA display the same with basic's)
B. **ON Delay Time Ton2 999 sec.**
C. **OFF Delay Time Toff2 999 sec.**

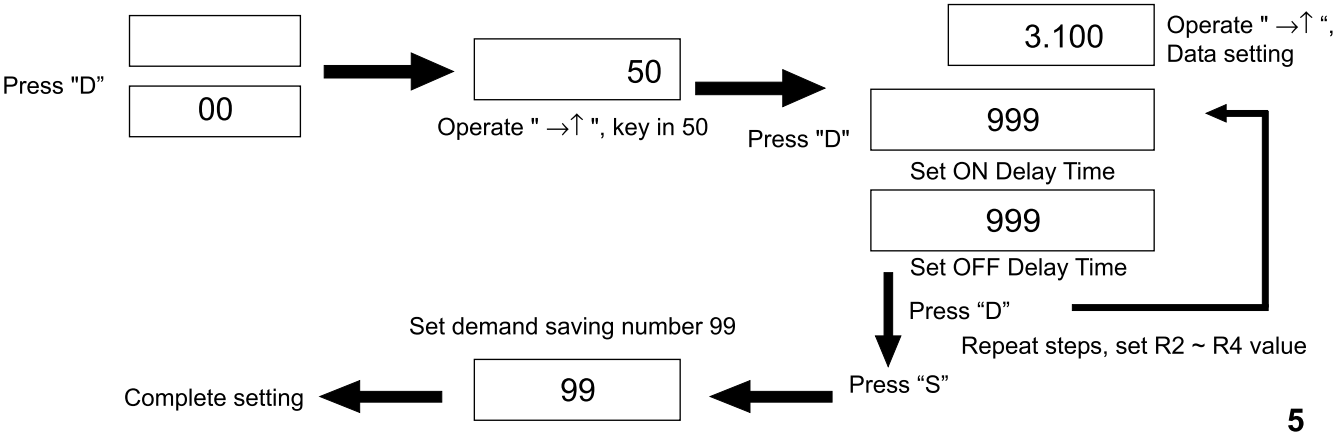
R3 (Unit 3 Relay) A. Demand setting value (Pr) (9999 digits, unit mark of KW & VA display the same with basic's)
B. **ON Delay Time Ton3 999 sec.**
C. **OFF Delay Time Toff3 999 sec.**

R4 (Unit 4 Relay) A. Demand setting value (Pr) (9999 digits, unit mark of KW & VA display the same with basic's)
B. **ON Delay Time Ton4 999 sec.**
C. **OFF Delay Time Toff4 999 sec.**

Press ⟶ , enter demand display

Set R1 (Unit 1 Relay) ~ R4 (Unit 4 Relay)
Set R1 (Unit 1 Relay) ~ R1 shines.
Set R2 (Unit 2 Relay) ~ R2 shines.
Set R3 (Unit 3 Relay) ~ R3 shines.
Set R4 (Unit 4 Relay) ~ R4 shines.



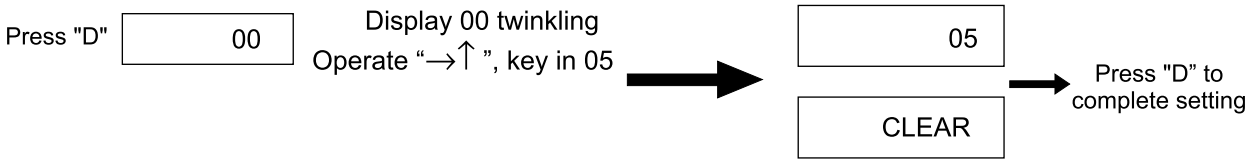


7. Synchronous Setting for Time Calculation

7.1 Demand control under STOP condition can be performed.

7.2 Enter twentieth page demand display, press “D”, operate “ →↑ “ again, key in 05, press “D” twice.

7.3 Press ⟶ , enter demand display



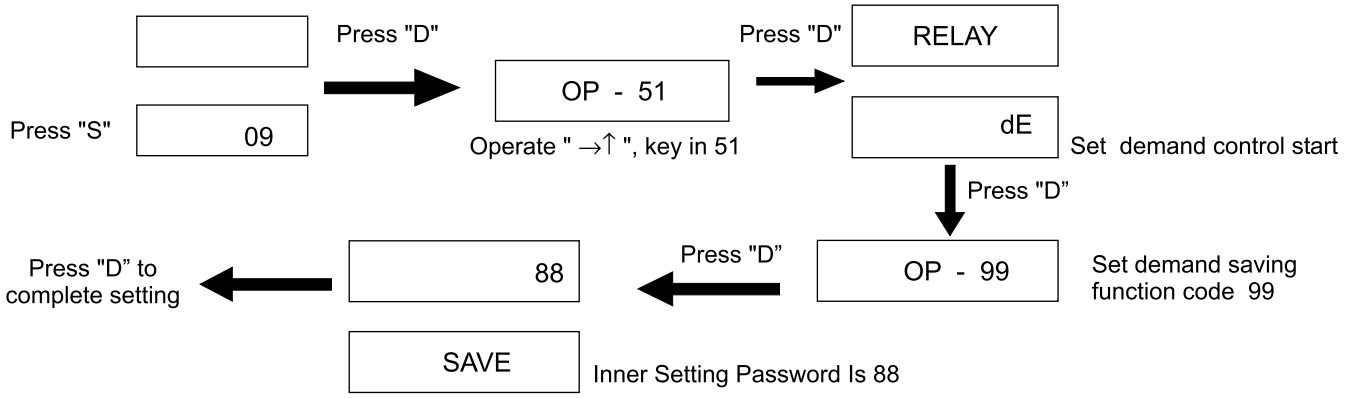
8. Alarm System or Demand Control

8.1 Select alarm function only performs normal current, voltage, watt, var, power factor and frequency alarm function (”S” button -09-50)

8.2 To Select demand control function, need to enter twentieth page. Then demand control procedure can be performed.

8.3 Enter basic display, press “S”, enter 09 function.

8.4 Demand control function code is dE, alarm function code is N.

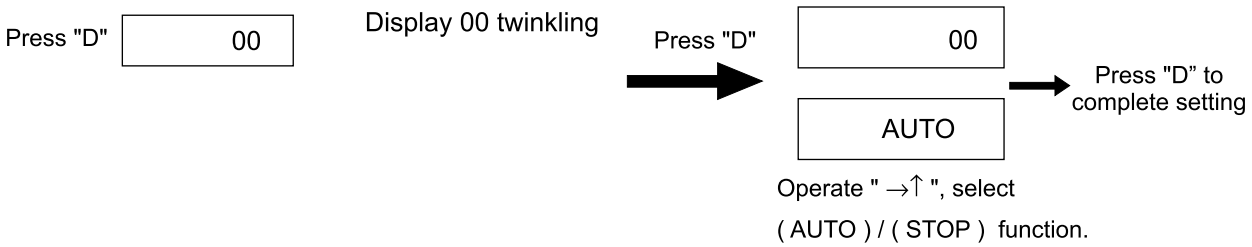


9. Start or stop Demand Control

9.1 Before use, need to select above item 8 first.

9.2 Demand control is unique control function, need to enter twentieth page, start from pressing demand display buttons (similar with demand synchronous button).

9.3 Press ⟶ , enter demand display.

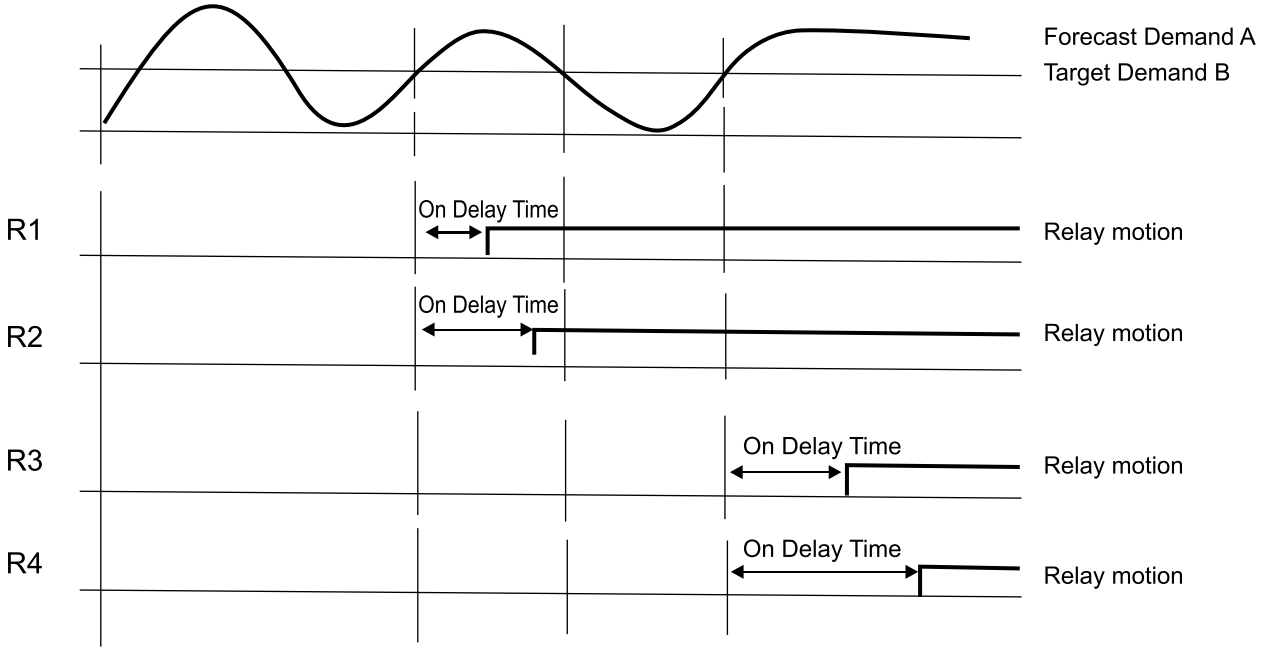


10. Control Procedure Description :

10.1 Forecast Demand control

A. Forecast Demand B : Target Demand

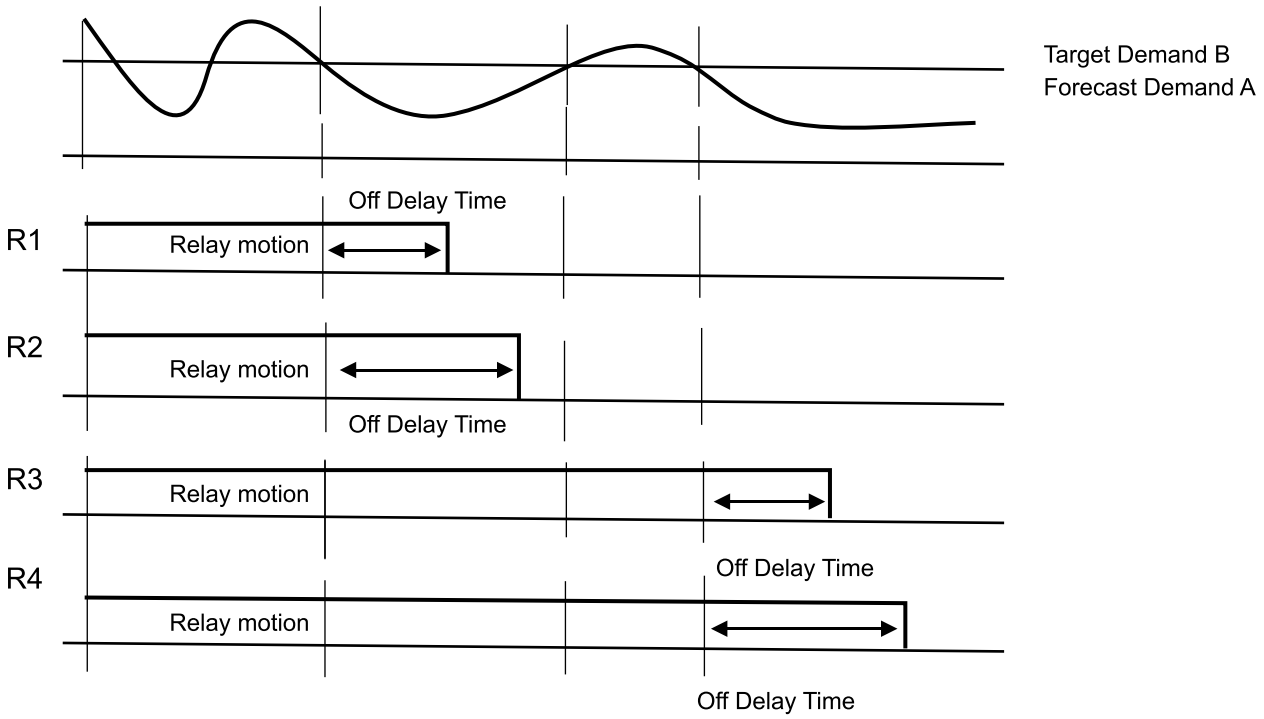
10.1.1 A > B T Start time counting, when exceed Ton1, Relay1 starts. When exceed Ton2, Relay2 starts. When exceed Ton3, Relay3 starts. When exceed Ton4, Relay4 starts.



A: Forecast Demand B: Target Demand

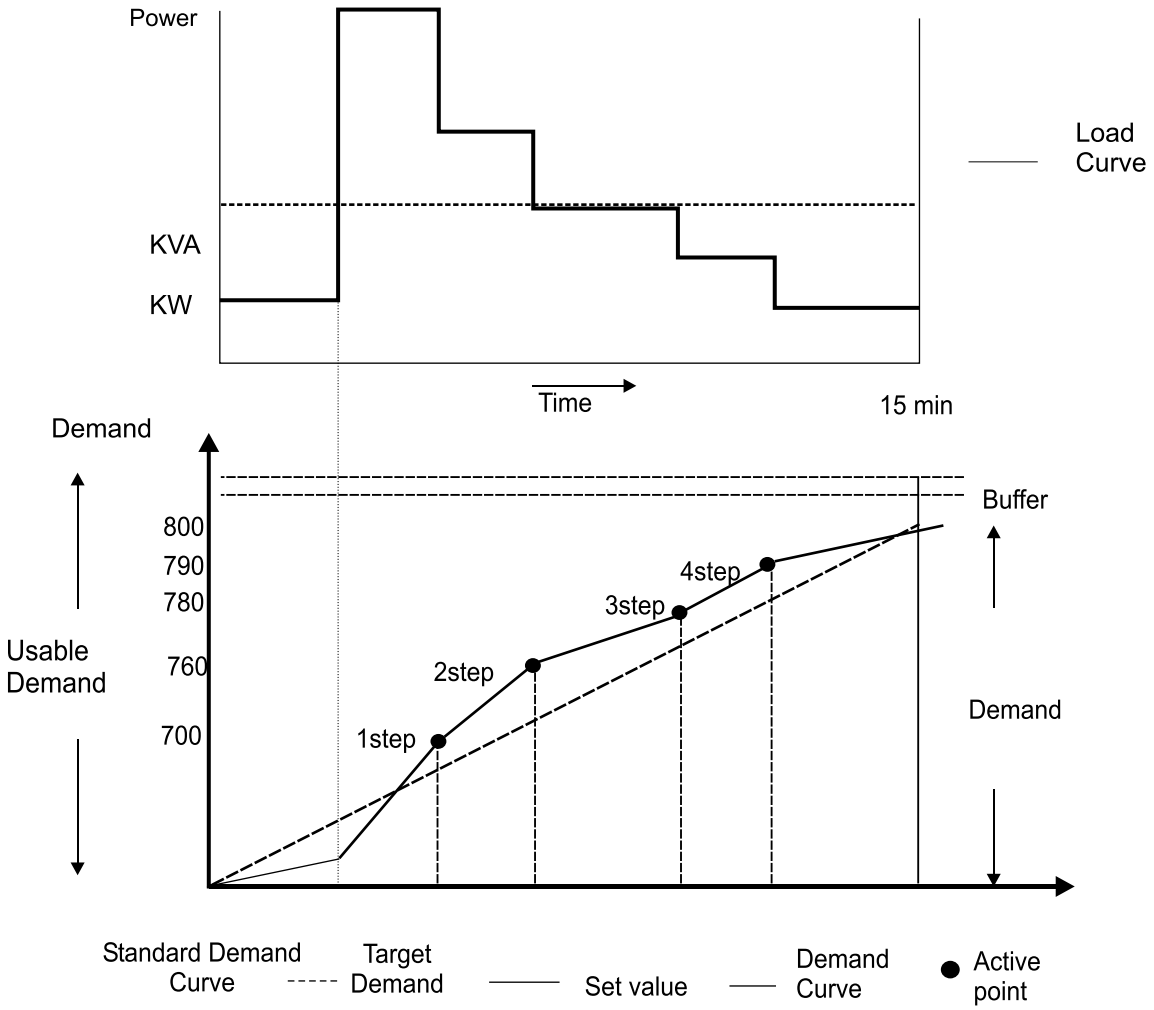
10.1.2 A < B Return to zero, control by **OFF Delay Time** of Relay setting.

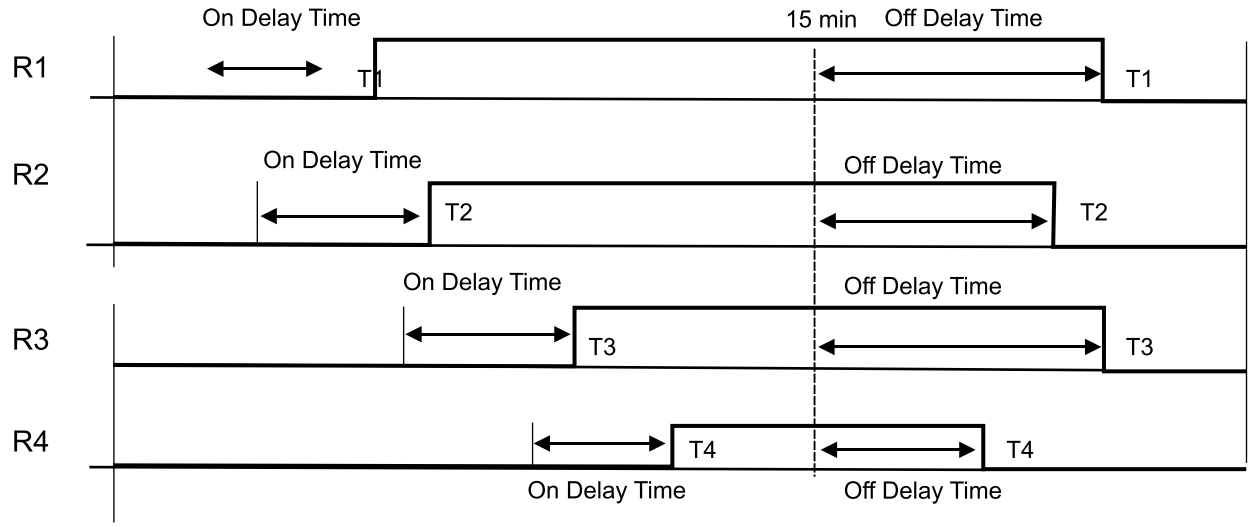
When A < B, start to count; when T over **T off, Delay** zero.



10.2 Present Demand Control

Present Demand higher than Demand control setting value, Relay 1 moves.





11. Term Description :

* Maximum Demand : To record the maximum demand value. The demand shall be changed as per each time interval (1-60 minutes). For example, time interval is 15 minutes, the present demand is calculated once as per 15 minutes. The maximum demand shall be recorder by the maximum demand and supply power system the highest contractual power.

* Target Demand : It means that the contractual capacity as being applied by the user, or the demand value that the user expect to reach. This value can be decided by user. According to contractual capacity, target contractual capacity which need to be managed is defined in 75% of the highest contractual capacity.

* Present Demand : The present demand is zero at the beginning and is getting increased as followed by the time interval until the end of entire demand interval and then returning to zero to recalculate. Cumulative time can be setted from 09-17, from 0 start cumulating. When time over, return to zero to recalculate.

* Demand Forecast : According to consumed demand forecast to forecast demand value of the time. The terminal point of time interval in the demand forecast shall reach the demand value according to the variation on the present power and the present curve to estimate. The user may adjust the present load in accordance with the demand forecast and avoid exceeding the contractual capacity.

* Useable Demand : According to the current consumed demand to calculate the usable demand prior to the end of time (this value shall be calculated by microprocessor), which means that the usable power prior to the end of remaining time. Useable remaining demand within the time interval.