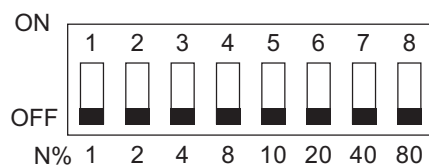


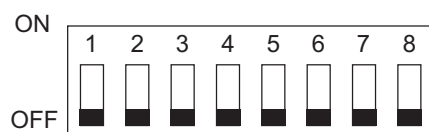
# COMPACT PROGRAMMABLE DC TRANSMITTER

- S3 → Input range offset (GAIN) selection



Status off = enable  
 All poles off  $\sum N = 165\%$   
 All poles on  $\sum N = 0\%$   
 Output mode Selection

- S4 → Output mode Selection



Status ON = 1, OFF = 0

Output Range	O/P Range 1-2-3-4-5-6	O/P Mode 7-8
0 ~ 0.5V	0-1-1-1-1-0	1-1
0 ~ 1V	1-0-1-1-1-0	1-1
0 ~ 2V	1-1-0-1-1-0	1-1
0 ~ 4V	1-1-1-0-1-0	1-1
0 ~ 5V	1-0-1-0-1-0	1-1
1 ~ 5V	1-1-1-0-1-1	1-1
0 ~ 6V	1-1-0-0-1-0	1-1
0 ~ 8V	1-1-1-1-0-0	1-1
0 ~ 10V	1-1-0-1-0-0	1-1
2 ~ 10V	1-1-1-1-0-1	1-1
0 ~ 1mA	0-1-1-1-1-0	0-0
0 ~ 2mA	1-0-1-1-1-0	0-0
0 ~ 5mA	0-1-0-1-1-0	0-0
1 ~ 5mA	1-1-0-1-1-1	0-0
0 ~ 10mA	1-0-1-0-1-0	0-0
2 ~ 10mA	1-1-1-0-1-1	0-0
0 ~ 16mA	1-1-1-1-0-0	0-0
0 ~ 20mA	1-1-0-1-0-0	0-0
4 ~ 20mA	1-1-1-1-0-1	0-0

## 4. Programming formula

VH/VL: Voltage input high/low

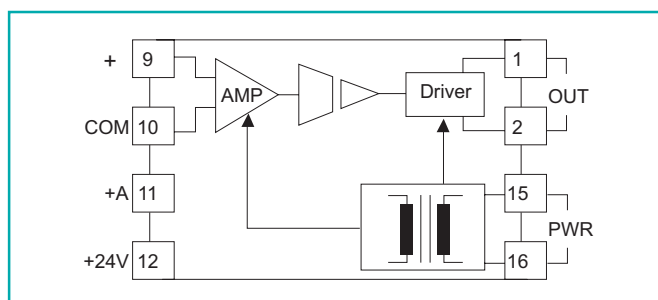
AH/AL: Current input high/low

G: Prgain

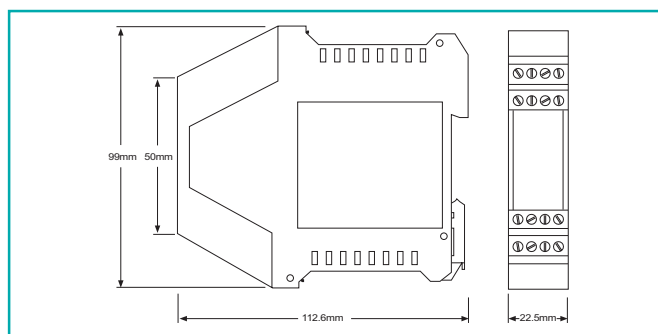
Voltage mode (V)	Current mode (mA)
• Span = $[10 / G (VH - VL)] \%$	• Span = $[500 / G (AH - AL)] \%$
• Offset = $(100 \times G \times VL) \%$	• Offset = $(2G \times AL) \%$

- ★ Note: 1. Range selection: IVH-VLI should be  $\geq 0.1$  IVHI limited of prgain & range selection
2. Solution of non-linear problem: at input span IVH-VLI  $\leq 0.2$  IVHI, at normal setting switching calibration, if non-linear happened, shifting offset switches up or down 1-2%, recalibrating to obtain correct output.

## 5. Terminal connection



## 6. Dimension:



## 7. Input switching table (S1, S2, S3)

(Status on = 1; off = 0; don't care = X)

Input range	S2 (ZERO) 1-2-3-4-5-6-7-8	S3 (SPAN) 1-2-3-4-5-6-7-8	S1 1-2-3-4
0~10 mV	1-1-1-1-1-1-1-1	1-1-1-1-0-1-1-1	1-0-0-X
0~20 mV	1-1-1-1-1-1-1-1	0-1-0-1-1-1-1-1	1-0-0-X
0~50 mV	1-1-1-1-1-1-1-1	1-1-1-1-1-0-1-1	1-0-1-X
0~100 mV	1-1-1-1-1-1-1-1	1-1-1-1-0-1-1-1	1-0-1-X
0~200 mV	1-1-1-1-1-1-1-1	0-1-0-1-1-1-1-1	1-0-1-X
0~500 mV	1-1-1-1-1-1-1-1	1-1-1-1-1-0-1-1	0-0-0-X
0~1 V	1-1-1-1-1-1-1-1	1-1-1-1-0-1-1-1	0-0-0-X
-1~1 V	1-1-1-1-1-0-1-0	0-1-0-1-1-1-1-1	0-0-0-0
0~2 V	1-1-1-1-1-1-1-1	0-1-0-1-1-1-1-1	0-0-0-X
0~5 V	1-1-1-1-1-1-1-1	1-1-1-1-1-0-1-1	0-0-1-X
1~5 V	1-1-1-1-0-1-1-1	1-1-0-1-1-0-1-1	0-0-1-1
-5~5 V	1-1-1-1-0-1-0-1	1-1-1-1-0-1-1-1	0-0-1-0
0~10 V	1-1-1-1-1-1-1-1	1-1-1-1-0-1-1-1	0-0-1-X
2~10 V	1-1-1-1-1-0-1-1	0-0-1-1-0-1-1-1	0-0-1-1
-10~10 V	1-1-1-1-1-0-1-0	0-1-0-1-1-1-1-1	0-0-1-0
0~20 V	1-1-1-1-1-1-1-1	0-1-0-1-1-1-1-1	0-0-1-X
0~50 V	1-1-1-1-1-1-1-1	1-1-1-1-1-0-1-1	0-1-1-X
0~100 V	1-1-1-1-1-1-1-1	1-1-1-1-0-1-1-1	0-1-1-X
0~200 V	1-1-1-1-1-1-1-1	0-1-0-1-1-1-1-1	0-1-1-X
0~0.2 mA	1-1-1-1-1-1-1-1	0-1-0-1-1-0-1-1	1-0-0-X
0~0.5 mA	1-1-1-1-1-1-1-1	1-1-1-1-0-1-1-1	1-0-0-X
0~1 mA	1-1-1-1-1-1-1-1	1-1-1-1-0-1-0-1	1-0-1-X
0~2 mA	1-1-1-1-1-1-1-1	0-1-0-1-1-0-1-1	1-0-1-X
0~5 mA	1-1-1-1-1-1-1-1	1-1-1-1-0-1-1-1	1-0-1-X
1~5 mA	1-1-1-1-1-0-1-1	0-0-1-1-0-1-1-1	1-0-1-1
0~10 mA	1-1-1-1-1-1-1-1	1-1-1-1-0-1-0-1	1-1-1-X
2~10 mA	1-1-0-1-1-1-1-1	0-0-1-1-1-0-0-1	1-1-1-1
0~20 mA	1-1-1-1-1-1-1-1	0-1-0-1-1-0-1-1	1-1-1-X
4~20 mA	1-1-1-0-1-1-1-1	0-1-1-1-0-0-1-1	1-1-1-1
10~50 mA	1-1-1-1-1-0-1-1	0-0-1-1-0-1-1-1	1-1-1-1
*20~4 mA	1-1-1-1-1-1-0-1	0-1-1-1-0-0-1-1	1-1-1-0
*50~10 mA	1-1-1-1-1-0-1-0	0-0-1-1-0-1-1-1	1-1-1-0

\* 20~4 & 50~10 mA be reversed of input connection

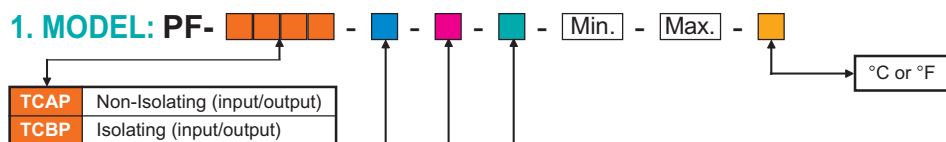
## COMPACT MICROPROCESS TEMPERATURE TRANSMITTER



## FEATURES

- Accuracy  $\pm 0.2\%$  F.S.  $\pm 0.5^{\circ}\text{C}$  (CJC) for Thermocouple.  
Accuracy  $\pm 0.1\%$  F.S. for RTD.
- 3-way isolation, input/output/power.
- Input/output isolation 1.6KVdc.
- 3-wire RTD configuration automatically compensating wire resistance effects.
- Input type and range selectable with DIP switches for PF-TCAP or Man-machine interface for PF-TCBP.
- Sensor break detection function.

## 1. MODEL: PF-



NO	Ranges RL~RH	NO	Output Voltages/Current	NO	Aux. Power
1	Pt100 $\alpha=0.00385$ (-200 ~ +1200°C)	A	0 ~ 0.5 V	1	AC 100 ~ 240 V $\pm 10\%$
2	Pt100 $\alpha=0.00392$ (-200 ~ +600°C)	B	0 ~ 1 V	2	DC 20 ~ 70 V $\pm 10\%$
B	B-type T/C (0 ~ +1800°C)	C	0 ~ 2 V	3	DC 110 V $\pm 10\%$
E	E-type T/C (-200 ~ +1000°C)	D	0 ~ 4 V	4	DC 220 V $\pm 10\%$
J	J-type T/C (-200 ~ +1200°C)	E	0 ~ 5 V	5	DC/AC 24V $\pm 10\%$
K	K-type T/C (-200 ~ +1370°C)	F	1 ~ 5 V	9	SPECIFIED
N	N-type T/C (-100 ~ +1300°C)	G	0 ~ 8 V		
P	Platinel II-type T/C (0 ~ +1395°C)	H	0 ~ 10 V		
R	R-type T/C (0 ~ +1760°C)	I	2 ~ 10 V		
S	S-type T/C (0 ~ +1760°C)	J	0 ~ 1 mA		
T	T-type T/C (-200 ~ +400°C)	K	0 ~ 2 mA		
* Transmitter may not satisfy specified accuracy in the conditions that are 0 ~ 400°C of R-type T/C and 0 ~ 500°C of B-type T/C.		L	0 ~ 5 mA		
		M	1 ~ 5 mA		
		N	0 ~ 10 mA		
		O	0 ~ 16 mA		
		P	0 ~ 20 mA		
		Q	4 ~ 20 mA		
		R	SPECIFIED		

## 2. Specification

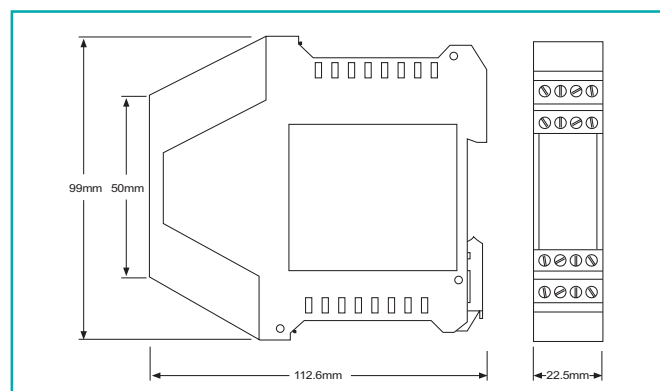
- Accuracy (23±5°C) : For Thermocouple  
±0.2% F.S. ±0.5°C (CJC)  
For RTD  
±0.1% F.S.
- Update time : 0.2 second without Filter  
1.0 second with Filter
- Readout range (TCBP) : -19999 ~ 99999 digit adjustable
- Display (TCBP) : Red LEDs 0.3" (7.62mm)
- Over input indication : PWR LED flash  
(Input break function)
- Analog output resolution : 16-bit DAC
- Output ripple (p-p) : <0.1% F.S.
- Temp. coefficient : 100ppm/°C (0 ~ 50°C)
- Dielectric strength : 1.5KVac/1min.(power/input/output)  
1600Vdc(input/output)
- Output drive capability : ≤20mA for voltage mode  
≤14V for current mode
- Response time : ≤100ms (0~90%)
- Operation condition : 0~55°C (humidity 20~95% RH  
non-condensed)
- Storage condition : 0~70°C (humidity 20~95% RH  
non-condensed)
- Power Consumption : ≤4.7VA(AC power)

## 5. Application

Example: **PF-TCAP-J-Q-1- -100 - 300°F**

INPUT TYPE.....Thermocouple J type  
 OUTPUT.....DC 4 ~ 20 mA  
 POWER.....AC 100 ~ 240V  
 LOWER RANGE.....-100°F  
 FULL RANGE.....(300°F ~ -100°F) = 400°F  
 CJC.....Enable  
 UNIT.....°F  
 FILTER.....Disable  
 S1.....P2-P6-ON & the rest OFF  
 S2.....P3-P4-P6-ON & the rest OFF  
 S3.....P5-P7-P8-OFF & the rest ON

## 6. Dimension:



# COMPACT MICROPROCESSOR TEMPERATURE TRANSMITTER

## 3. Function switches (S1, S2, S3) for PF-TCAP

### • Input type switches (ON=1, OFF=0)

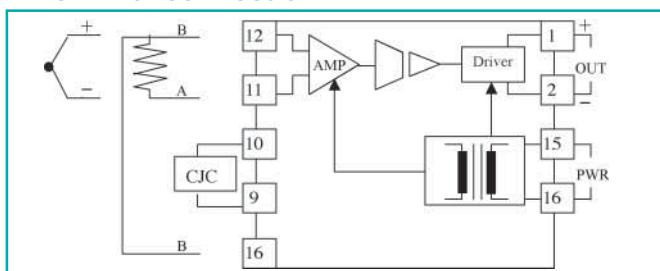
S1	
Type	1-2-3-4
1	0-0-0-0
2	0-0-0-1
B	0-0-1-0
E	0-0-1-1
J	0-1-0-0
K	0-1-0-1
N	0-1-1-0
P	0-1-1-1
R	1-0-0-0
S	1-0-0-1
T	1-0-1-0

### • Full range switches (ON=1, OFF=0)

S2	
Full range	1-2-3-4-5
100°C / 100°F	0-0-0-0-0
150°C / 150°F	0-0-0-0-1
200°C / 200°F	0-0-0-1-0
250°C / 250°F	0-0-0-1-1
300°C / 300°F	0-0-1-0-0
350°C / 350°F	0-0-1-0-1
400°C / 400°F	0-0-1-1-0
450°C / 450°F	0-0-1-1-1
500°C / 500°F	0-1-0-0-0
550°C / 550°F	0-1-0-0-1
600°C / 600°F	0-1-0-1-0
650°C / 650°F	0-1-0-1-1
700°C / 700°F	0-1-1-0-0
750°C / 750°F	0-1-1-0-1
800°C / 800°F	0-1-1-1-0
850°C / 850°F	0-1-1-1-1
900°C / 900°F	1-0-0-0-0
950°C / 950°F	1-0-0-0-1
1000°C / 1000°F	1-0-0-1-0
1050°C / 1100°F	1-0-0-1-1
1100°C / 1200°F	1-0-1-0-0
1150°C / 1300°F	1-0-1-0-1
1200°C / 1400°F	1-0-1-1-0
1250°C / 1500°F	1-0-1-1-1
1300°C / 1600°F	1-1-0-0-0
1350°C / 1700°F	1-1-0-0-1
1400°C / 1800°F	1-1-0-1-0
1450°C / 1900°F	1-1-0-1-1
1500°C / 2000°F	1-1-1-0-0
1600°C / 2500°F	1-1-1-0-1
1700°C / 3000°F	1-1-1-1-0
1800°C / 3500°F	1-1-1-1-1

Full Range = Max. of input range – Min. of input range

## 4. Terminal connection



Note1: Black plastic part of CJC element must be very close to negative terminal of the thermocouple.

Note2: Two-wire RTD application shorting terminals 16 & 12.

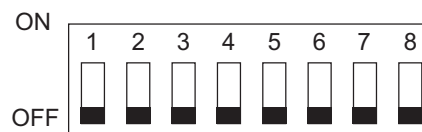
### • Lower range switches (ON=1, OFF=0)

S1	
Lower range	5-6-7-8
-200°C / -350°F	0-0-0-0
-150°C / -250°F	0-0-0-1
-100°C / -200°F	0-0-1-0
-50°C / -150°F	0-0-1-1
-40°C / -100°F	0-1-0-0
-30°C / -50°F	0-1-0-1
-20°C / 0°F	0-1-1-0
-10°C / +50°F	0-1-1-1
0°C / +100°F	1-0-0-0
+50°C / +150°F	1-0-0-1
+100°C / +200°F	1-0-1-0
+150°C / +250°F	1-0-1-1
+200°C / +500°F	1-1-0-0
+250°C / +1000°F	1-1-0-1
+500°C / +2000°F	1-1-1-0
+1000°C / +2500°F	1-1-1-1

### • Misc. switches (ON=1, OFF=0)

S2			
CJC	6	Unit	7
Enable	1	°C	1
Disable	0	°F	0
Filter	8	Enable	1
		Disable	0

### • Output mode selection



Status on =1, off=0

Output Range	O/P Range 1-2-3-4-5-6	O/P Mode 7-8
0 ~ 0.5V	0-1-1-1-1-0	1-1
0 ~ 1V	1-0-1-1-1-0	1-1
0 ~ 2V	1-1-0-1-1-0	1-1
0 ~ 4V	1-1-1-0-1-0	1-1
0 ~ 5V	1-0-1-0-1-0	1-1
1 ~ 5V	1-1-1-0-1-1	1-1
0 ~ 6V	1-1-0-0-1-0	1-1
0 ~ 8V	1-1-1-1-0-0	1-1
0 ~ 10V	1-1-0-1-0-0	1-1
2 ~ 10V	1-1-1-1-0-1	1-1
0 ~ 1mA	0-1-1-1-1-0	0-0
0 ~ 2mA	1-0-1-1-1-0	0-0
0 ~ 5mA	0-1-0-1-1-0	0-0
1 ~ 5mA	1-1-0-1-1-1	0-0
0 ~ 10mA	1-0-1-0-1-0	0-0
2 ~ 10mA	1-1-1-0-1-1	0-0
0 ~ 16mA	1-1-1-1-0-0	0-0
0 ~ 20mA	1-1-0-1-0-0	0-0
4 ~ 20mA	1-1-1-1-0-1	0-0

Note: S1 and S2 switch functions are instead of Man-Machine interface in PF-TCBP. See the instruction manual of PF-TCBP.

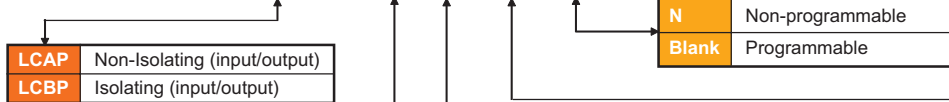
# COMPACT PROGRAMMABLE LOAD CELL TRANSMITTER



## FEATURES

- Field-rangeable. Wide switchable input ranges 200 to 50K $\Omega$ , Wide switchable output ranges over 20 standard process ranges.
- Accuracy 0.1%F.S.
- 3-way isolation, input/output/power (optional)
- Optical isolation with 2KVac/1 min for Input/Output (optional)

## 1. MODEL: PF- [ ] - [ ] - [ ] - [ ]



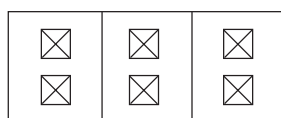
NO	Input Ranges	NO	Exciting Voltages	NO	Output Voltage/Current	NO	Aux. Power
A	0 ~ 3 mV	1	2.5 v	A	0 ~ 0.5 V	1	AC 100V~240V $\pm$ 10 %
B	0 ~ 4 mV	2	5.0 v	B	0 ~ 1 V	2	DC 20V~70V $\pm$ 10 %
C	0 ~ 5 mV	3	10.0 v	C	0 ~ 2 V	3	DC 110V $\pm$ 10 %
D	0 ~ 6 mV	4	12.0 v	D	0 ~ 4 V	4	DC 220V $\pm$ 10 %
E	0 ~ 8 mV	9	SPECIFIED	E	0 ~ 5 V	5	DC/AC 24V $\pm$ 10 %
F	0 ~ 10 mV	• Max. output current 100mA		F	1 ~ 5 V	9	SPECIFIED
G	0 ~ 12 mV			G	0 ~ 8 V		
H	0 ~ 15 mV			H	0 ~ 10 V		
I	0 ~ 18 mV			I	2 ~ 10 V		
J	0 ~ 20 mV			J	0 ~ 1 mA		
K	0 ~ 24 mV			K	0 ~ 2 mA		
L	0 ~ 25 mV			L	0 ~ 5 mA		
M	0 ~ 27 mV			M	1 ~ 5 mA		
N	0 ~ 30 mV			N	0 ~ 10 mA		
O	0 ~ 50 mV			O	0 ~ 16 mA		
P	0 ~ 60 mV			P	0 ~ 20 mA		
Q	0 ~ 90 mV			Q	4 ~ 20 mA		
R	SPECIFIED			R	SPECIFIED		

## 2. Specification

- Accuracy : 0.1% F.S. (23 $\pm$ 5 $^{\circ}$ C)
- Output ripple (p-p) : <0.1% F.S.
- Temp. coefficient : 100ppm/ $^{\circ}$ C (0-50 $^{\circ}$ C)
- Exciting voltage : 2.5/5.0/10.0/12.0V ( $\leq$ 100mA)
- Power consumption :  $\leq$ 4.7VA (AC power)
- Dielectric strength : 1.5KVac/1 min. (power/input/output)  
1600Vdc (input/output)
- Output drive capability :  $\leq$ 20mA for voltage mode  
 $\leq$ 14V for current mode
- Response time :  $\leq$ 200ms (0~90%)
- Operating condition : 0~55 $^{\circ}$ C (humidity 20~95% RH non-condensed)
- Storage condition : 0~70 $^{\circ}$ C (humidity 20~95% RH non-condensed)

## 3. Function switches (S1, S2, S3, S4)

- S1  $\rightarrow$  Input exciting voltage



DC5V DC10V DC12V

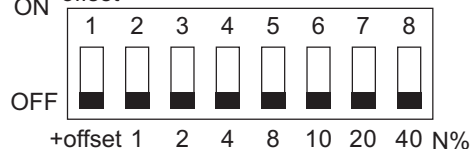
SHORT for enable and OPEN for disable (Only one is short)  
None is short for DC 2.5V

- S2  $\rightarrow$  Input range offset (ZERO) selection

P1: input offset polarity selection

P2-P3-P4-P5-P6-P7-P8: input range offset (ZERO) selection

ON -offset



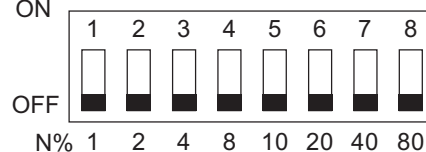
+offset 1 2 4 8 10 20 40 N%  
Status off = enable

All poles off  $\Sigma$ N = 85%

All poles on  $\Sigma$ N = 0%

- S3  $\rightarrow$  Input range span (GAIN) selection

ON



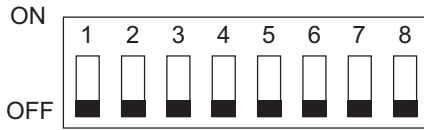
N% 1 2 4 8 10 20 40 80  
Status off = enable

All poles off  $\Sigma$ N = 165%

All poles on  $\Sigma$ N = 0%

# COMPACT PROGRAMMABLE LOAD CELL TRANSMITTER

- S4 → Output mode Selection



Status on = 1, off = 0

Output Range	O/P Range 1-2-3-4-5-6	O/P Mode 7-8
0 ~ 0.5V	0-1-1-1-1-0	1-1
0 ~ 1V	1-0-1-1-1-0	1-1
0 ~ 2V	1-1-0-1-1-0	1-1
0 ~ 4V	1-1-1-0-1-0	1-1
0 ~ 5V	1-0-1-0-1-0	1-1
1 ~ 5V	1-1-1-0-1-1	1-1
0 ~ 6V	1-1-0-0-1-0	1-1
0 ~ 8V	1-1-1-1-0-0	1-1
0 ~ 10V	1-1-0-1-0-0	1-1
2 ~ 10V	1-1-1-1-0-1	1-1
0 ~ 1mA	0-1-1-1-1-0	0-0
0 ~ 2mA	1-0-1-1-1-0	0-0
0 ~ 5mA	0-1-0-1-1-0	0-0
1 ~ 5mA	1-1-0-1-1-1	0-0
0 ~ 10mA	1-0-1-0-1-0	0-0
2 ~ 10mA	1-1-1-0-1-1	0-0
0 ~ 16mA	1-1-1-1-0-0	0-0
0 ~ 20mA	1-1-0-1-0-0	0-0
4 ~ 20mA	1-1-1-1-0-1	0-0

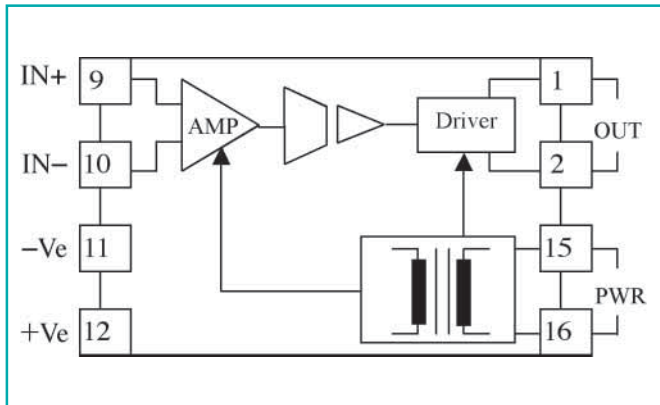
## 4. Programming formula

VH/VL: input high/low (unit: mV)

- Span →  $X = [500/(VH-VL)]\%$
- Offset →  $Y = VL\%$

Note: on field application, the required offset at no load status just switching S2 of 1% = 1mV offset

## 5. Terminal connection



## 6. Input switching table (S2, S3)

(Status-on = 1, off = 0, don't care = X)

Input range (VH-VL)	S3 1-2-3-4-5-6-7-8
3 mV	*0-0-0-0-0-0-0-0
4 mV	0-1-0-1-1-1-0-0
5 mV	1-1-1-1-1-0-1-0
6 mV	*0-0-1-1-1-1-1-0
8 mV	*0-0-1-1-1-0-0-1
10 mV	1-1-1-1-0-1-0-1
12 mV	*1-0-1-1-1-1-0-1
15 mV	*0-0-1-1-0-0-1-1
18 mV	*1-1-1-0-1-0-1-1
20 mV	0-1-0-1-1-0-1-1
24 mV	*0-1-1-1-1-0-1-1
25 mV	1-1-1-1-1-0-1-1
27 mV	*0-1-1-0-0-1-1-1
30 mV	*0-0-0-1-0-1-1-1
36 mV	*1-1-0-1-0-1-1-1
40 mV	*0-0-1-1-0-1-1-1
50 mV	1-1-1-1-0-1-1-1
60 mV	*1-1-1-0-1-1-1-1
90 mV	*1-0-0-1-1-1-1-1

\* Recalibration to obtain linear output

## 7. Application

Example: PF-LCBP-J2H-1

Exciting.....DC 10V

Input range.....VH=20mV, VL=0mV

Output.....DC 0~10V

Power.....AC 100 ~ 240V

Span  $X = [500/(20-0)]\% = 25\%$

Offset  $Y = 0\%$

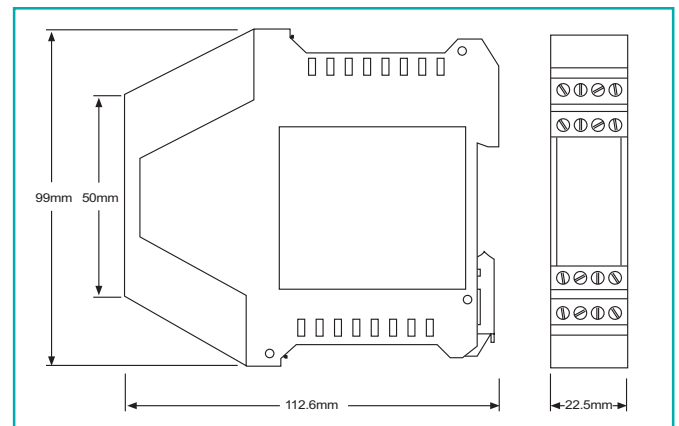
S1 → P2-on & the rest off

S2 → All poles on,  $\sum N=0\%$

S3 → P1-P3-P6-Off & the rest on,  $\sum N=25\%$

S4 → P3-P5-P6-Off & the rest on

## 8. Dimension:



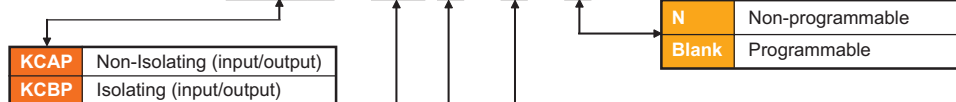
# COMPACT PROGRAMMABLE POTENTIOMETER TRANSMITTER



## FEATURES

- Field-rangeable. Wide switchable input ranges 200 to 50K $\Omega$ , Wide switchable output ranges over 20 standard process ranges.
- Accuracy 0.1%F.S.
- 3-way isolation, input/output/power (optional)
- Optical isolation with 2KVac/1 min for Input/Output (optional)

## 1. MODEL: PF- [ ] - [ ] - [ ] - [ ]



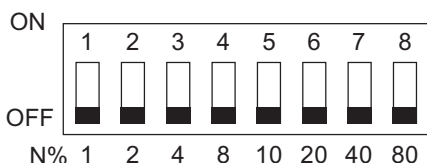
NO	Ranges RL~RH	%	NO	Output Voltages/Current	NO	Aux. Power
10	0 ~ 10	%	A	0 ~ 0.5 V	1	AC 100V~240V $\pm$ 10 %
11	0 ~ 15	%	B	0 ~ 1 V	2	DC 20V~70V $\pm$ 10 %
12	0 ~ 20	%	C	0 ~ 2 V	3	DC 110V $\pm$ 10 %
13	0 ~ 25	%	D	0 ~ 4 V	4	DC 220V $\pm$ 10 %
14	0 ~ 30	%	E	0 ~ 5 V	5	DC/AC 24V $\pm$ 10 %
15	0 ~ 40	%	F	1 ~ 5 V	9	SPECIFIED
16	0 ~ 50	%	G	0 ~ 8 V		
17	0 ~ 60	%	H	0 ~ 10 V		
18	0 ~ 70	%	I	2 ~ 10 V		
19	0 ~ 80	%	J	0 ~ 1 mA		
20	0 ~ 90	%	K	0 ~ 2 mA		
21	0 ~ 100	%	L	0 ~ 5 mA		
22	5 ~ 95	%	M	1 ~ 5 mA		
23	10 ~ 90	%	N	0 ~ 10 mA		
24	10 ~ 100	%	O	0 ~ 16 mA		
99	SPECIFIED		P	0 ~ 20 mA		
• Max. output current 100mA			Q	4 ~ 20 mA		
			R	SPECIFIED		

## 2. Specification

- Accuracy : 0.1% F.S. (23 $\pm$ 5°C)
- Output ripple (p-p) : <0.1% F.S.
- Temp. coefficient : 100ppm/°C (0-50°C)
- Exciting voltage : DC 2.5V ( $\leq$ 60mA)
- Power consumption :  $\leq$ 4.7VA (AC power)
- Dielectric strength : 1.5KVac/1 min. (power/input/output)  
1600Vdc (input/output)
- Output drive capability :  $\leq$ 20mA for voltage mode  
 $\leq$ 14V for current mode
- Response time :  $\leq$ 200ms (0~90%)
- Operating condition : 0~55°C humidity 20~95% RH  
non-condensed
- Storage condition : 0~70°C humidity 20~95% RH  
non-condensed

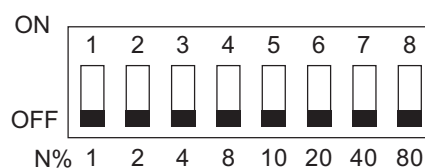
## 3. Function switches (S2, S3, S4)

- S2  $\rightarrow$  Input range offset (ZERO) selection



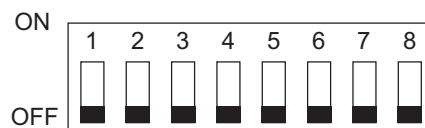
Status off = enable  
All poles off  $\Sigma$ N = 165%  
All poles on  $\Sigma$ N = 0%

- S3  $\rightarrow$  Input range span (GAIN) selection



Status off = enable  
All poles off  $\Sigma$ N = 165%  
All poles on  $\Sigma$ N = 0%

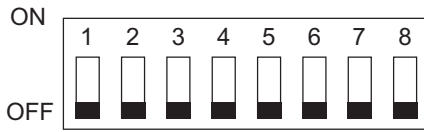
- S4  $\rightarrow$  Output mode Selection



Status on = 1, off = 0

# COMPACT PROGRAMMABLE POTENTIOMETER TRANSMITTER

- S4 → Output mode Selection



Status ON = 1, OFF = 0

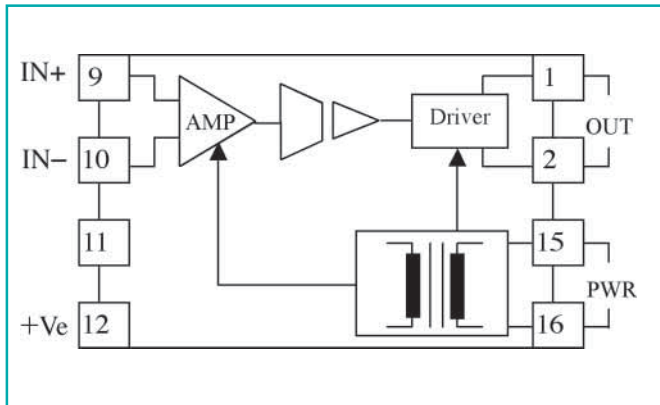
Output Range	O/P Range 1-2-3-4-5-6	O/P Mode 7-8
0 ~ 0.5V	0-1-1-1-1-0	1-1
0 ~ 1V	1-0-1-1-1-0	1-1
0 ~ 2V	1-1-0-1-1-0	1-1
0 ~ 4V	1-1-1-0-1-0	1-1
0 ~ 5V	1-0-1-0-1-0	1-1
1 ~ 5V	1-1-1-0-1-1	1-1
0 ~ 6V	1-1-0-0-1-0	1-1
0 ~ 8V	1-1-1-1-0-0	1-1
0 ~ 10V	1-1-0-1-0-0	1-1
2 ~ 10V	1-1-1-1-0-1	1-1
0 ~ 1mA	0-1-1-1-1-0	0-0
0 ~ 2mA	1-0-1-1-1-0	0-0
0 ~ 5mA	0-1-0-1-1-0	0-0
1 ~ 5mA	1-1-0-1-1-1	0-0
0 ~ 10mA	1-0-1-0-1-0	0-0
2 ~ 10mA	1-1-1-0-1-1	0-0
0 ~ 16mA	1-1-1-1-0-0	0-0
0 ~ 20mA	1-1-0-1-0-0	0-0
4 ~ 20mA	1-1-1-1-0-1	0-0

## 4. Programming formula

RH/RL: percent input high/percent input low

- Span →  $X = [10 / (RH - RL)] \%$
- Offset →  $Y = (100 \times RL) \%$

## 5. Terminal connection



## 6. Input switching table (S2, S3)

(Status-on = 1, off = 0, don't care = X)

Input range	S2 (ZERO) 1-2-3-4-5-6-7-8	S3 (SPAN) 1-2-3-4-5-6-7-8
0~10 %	1-1-1-1-1-1-1-1	1-1-1-1-1-0-1-0
0~15 %	1-1-1-1-1-1-1-1	*0-0-0-1-1-0-0-1
0~20 %	1-1-1-1-1-1-1-1	1-1-1-1-0-1-0-1
0~25 %	1-1-1-1-1-1-1-1	1-1-1-1-1-1-0-1
0~30 %	1-1-1-1-1-1-1-1	*0-0-1-1-0-0-1-1
0~40 %	1-1-1-1-1-1-1-1	0-1-0-1-1-0-1-1
0~50 %	1-1-1-1-1-1-1-1	1-1-1-1-1-0-1-1
0~60 %	1-1-1-1-1-1-1-1	*0-0-0-1-0-1-1-1
0~70 %	1-1-1-1-1-1-1-1	*1-1-0-1-0-1-1-1
0~80 %	1-1-1-1-1-1-1-1	*0-0-1-1-0-1-1-1
0~90 %	1-1-1-1-1-1-1-1	*0-1-1-1-0-1-1-1
0~100%	1-1-1-1-1-1-1-1	1-1-1-1-0-1-1-1
5~95 %	0-1-0-1-1-1-1-1	*0-1-1-1-0-1-1-1
10~90%	1-1-1-1-0-1-1-1	*0-0-1-1-0-1-1-1
10~100 %	1-1-1-1-0-1-1-1	0-1-1-1-0-1-1-1

\* Recalibration to obtain linear output

## 7. Application

Example: PF-KCBP-21Q-1

INPUT RANGE.....RH=100%, RL=0%

OUTPUT.....DC 4 ~ 20 mA

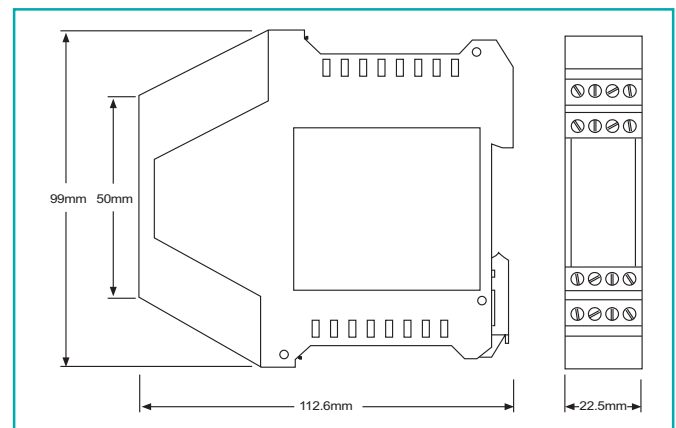
POWER.....AC 100 ~ 240V

S2.....All poles ON →  $\sum N = 0\%$

S3.....P5-OFF & the rest ON →  $\sum N = 10\%$

S4.....P5-P7-P8-OFF & the rest ON

## 8. Dimension:





# DIGITAL POWER METER OF PROGRAMMABLE



## FEATURES

- Accuracy 0.25% F.S. (watt, var, power factor)
- Wide switchable readout range
- Dielectric strength 2KVac (input/output/power)
- Surge test 4KV (1.2 x 50μs)
- High stability & Dimension small

## 1. MODEL: PF-M

NO	Input Type	NO	Input Unit	NO	Input Voltage (range)	NO	Input Current (range)	NO	Input Frequency	NO	Output Voltage	NO	Output Current	NO	Aux. Power
WW	Watt	1	102W	1	0-120V (85-150V)	1	0-1 A (0-1.2A)	A	50 Hz	11	DC 0-1V	21	DC 0-1 mA	1	AC 110/220V(50/60Hz)
VV	Var	3	303W	2	0-240V (180-300V)	2	0-5 A (0-6A)	B	60 Hz	12	DC 0-5 V	22	DC 0-5 mA	2	DC 24V
PF	Power Factor	4	304W	3	0-400V (320-480V)	3	SPECIFIED	C	400 Hz	13	DC 1-5 V	23	DC 0-10 mA	3	DC 48V
PA	Phase Angle	9	SPECIFIED	9	SPECIFIED			0	SPECIFIED	14	DC 0-10 V	24	DC 0-20 mA	4	DC 110V
								• Frequency ±10%		16	DC 2-10V	25	DC 4-20 mA	5	DC 220V
										19	SPECIFIED	29	SPECIFIED	6	AC 90~260V
														9	SPECIFIED
															• ±20% of rate, less 3.5VA for AC input • ±20% of rate, less 3W for DC input • ±10% of rate, less 3.5VA for AC switching input

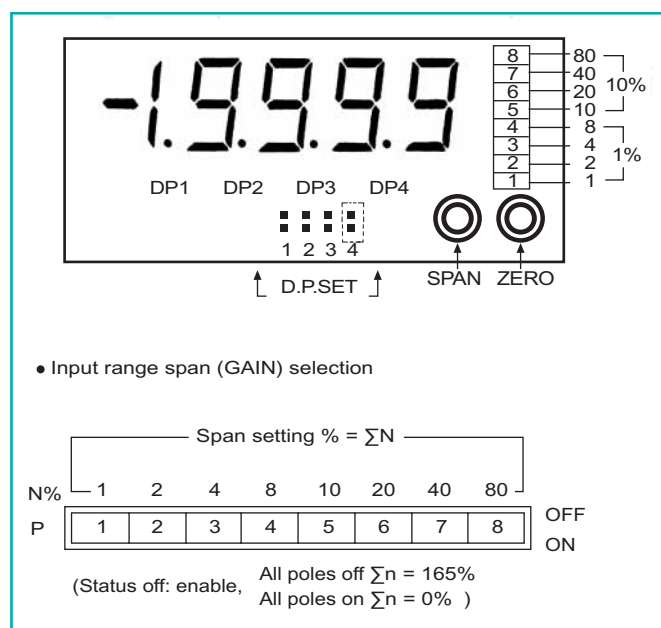
## 2. Specification

- Aux. power supply : AC110 & 220 ±20% (50 or 60Hz)  
(Optional DC 24V or 48V or 110V or 220V switching AC 90~260V±10%)
- Measuring accuracy : 0.25% F.S. (watt, var, phase angle)  
0.25% F.S.±0.25° (Power Factor)  
(-0.3~1, 0.3-1)
- Temp. coefficient : 100ppm/°C (0-50°C)
- Input burden : ≤ 0.2VA (Voltage); ≤0.2VA (Current)
- Max. input over : 3 x rated continuous (Current)  
2 x rated continuous (Voltage)
- Sampling time : 3 cycles/sec.
- Display : Red high efficiency LEDs high 14.22mm (0.56")
- Output ripple (p-p) : < 0.1% F.S
- Response time : ≤ 300ms (0-90%)
- Output drive capability : ≤ 10mA for voltage mode  
≤ 10V for current mode
- Dielectric strength : 2KVac/1 min. (power/input/output)
- Surge test : ANSI C37.90/1974, DIN-IEC255-4  
impulse voltage 4KV (1.2x50μs)
- Operating condition : 0~50°C (20 to 90% RH non-condensed)
- Storage condition : 0~70°C (20 to 90% RH non-condensed)

## 3. Standard analog calibration table (SAC)

Model		Element connection	Standard analog calibration (Watts or Vars)					
Watts	Vars		V = 120V		V = 240V		V = 400V	
			1A	5A	1A	5A	1A	5A
PW1	PV1	1Ø2W	100	500	200	1K	400	2K
PW3	PV3	3Ø3W	200	1K	400	2K	800	4K
PW4	PV4	3Ø4W	300	1.5K	600	3K	1.2K	6K

## 4. Outside dimension and connection diagram



## 5. Programming formula

- DR: display range
- SAC: standard analog calibration
- PR: PT ratio
- CR: CT ratio
- Y: percent output (0-100%)

- DR = PR x CR x SAC
- Span → X = [DR/200]%



# DIGITAL POWER METER OF PROGRAMMABLE

## 6. Application

### ▲ Example 1: PF-PWW1-12B

Input range ..... (PR = 110V/110V = 1)  
(1 $\phi$ 2W, 60Hz) (CR=100A/5A = 20)  
(SAC = 500W)

Display range ..... (DR = PR  $\times$  CR  $\times$  SAC  
= 1 $\times$ 20 $\times$ 500W  
= 10000W)

- (Span) X = (10000/200)% = 50%

• X → 

1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---

 ON  
OFF  
(P<sub>5</sub>-P<sub>7</sub>-off & the rest on →  $\Sigma$ N = 50%)

- Setting decimal point all off

### ▲ Example 2: PF-PWW3-12B

Input range ..... (PR = 69KV/115V = 600)  
(3 $\phi$ 3W, 60Hz) (CR = 1000A/5A = 200)  
(SAC = 1KW)

Display range ..... (DR = PR  $\times$  CR  $\times$  SAC  
= 600 $\times$ 200 $\times$ 1KW  
= 120.00MW)

- (Span) X = (12000/200)% = 60%

• X → 

1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---

 ON  
OFF  
(P<sub>6</sub>-P<sub>7</sub>-off & the rest on →  $\Sigma$ N = 60%)

- Setting decimal point "3" on

### ▲ Example 3: PF-PWW4-32B

Input range ..... (PR = 440V/440V = 1)  
(3 $\phi$ 4W, 60Hz) (CR = 1000A/5A = 200)  
(SAC = 6KW)

Display range ..... (DR = PR  $\times$  CR  $\times$  SAC  
= 1 $\times$ 200 $\times$ 6KW  
= 1200.0KW)

- (Span) X = (12000/200)% = 60%

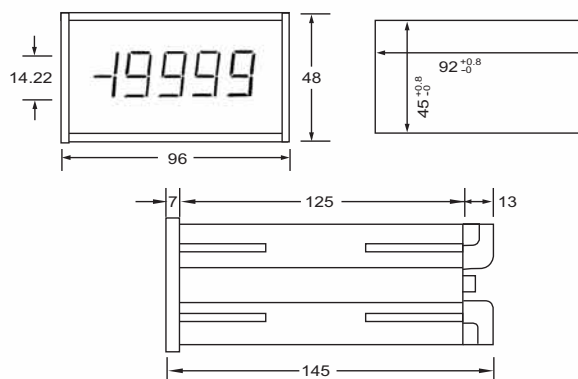
• X → 

1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---

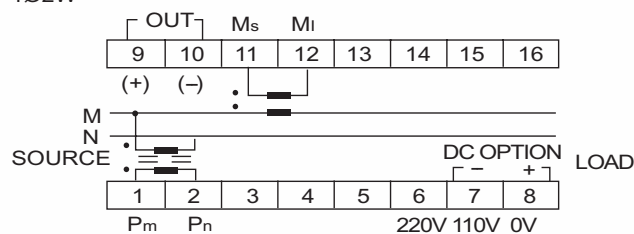
 ON  
OFF  
(P<sub>6</sub>-P<sub>7</sub>-off & the rest on →  $\Sigma$ N = 60%)

- Setting decimal point "4" on

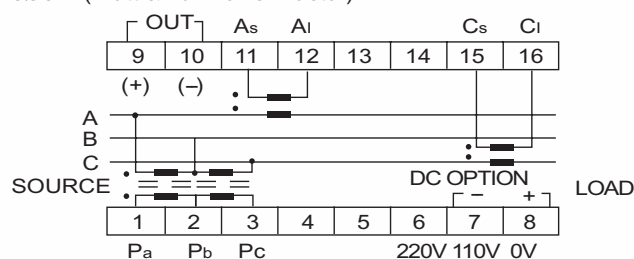
## 7. Outside dimension and connection diagram



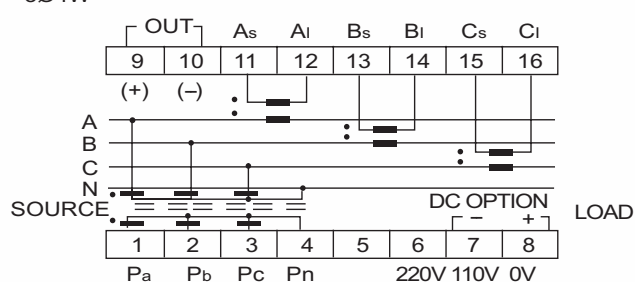
1 $\phi$ 2W



3 $\phi$ 3W (Watt & Var Power Factor)



3 $\phi$ 4W



## A digital scale with a black body and a red display. The display shows two rows of numbers: '00000000' on the top row and '0000' on the bottom row. To the left of the display are three buttons: 'ENT', a right arrow, and an up arrow. To the right of the display is a button labeled 'AZ'. The brand name 'POUNDFUL' is printed in red below the display. On the left side of the scale, there are labels for 'g', 'oz', and 'PUL'. The scale is shown from a slightly elevated angle.

- Programmable rate 0 to 9999 digit (watt or var), 0 to 99999999 digit (watthour or varhour)
- Accuracy 0.25% F.S.
- Programmable time base (1, 60, 3600 second)
- Programmable scale factor (0.0001 to 9999.9999)
- Decimal point can be modified
- Dual alarm, compare hysteresis function
- 15 bit DAC analog output function
- Dielectric strength 2KVac (input/output/power)
- Surge test 4KV (1.2x50 $\mu$ s)

NO	Input Type	NO	Input Unit	NO	Input Voltage (range)	NO	Input Current (range)	NO	Input Frequency	NO	Output Voltage (current)	NO	Aux. Power
WWH	Watt/Watthour	1	102W	1	0-120V (85-150V)	1	0-1 A (0-1.2A)	A	50 Hz	N	None	1	AC 110/220V
VVH	Var/Varhour	3	303W	2	0-240V (180-300V)	2	0-5 A (0-6A)	B	60 Hz	F	DC 1-5 V	2	DC 24V
		4	304W	3	0-400V (320-480V)	9	SPECIFIED	C	400 Hz	H	DC 0-10 V	3	DC 48V
		9	SPECIFIED	9	SPECIFIED			0	SPECIFIED	P	DC 0-20 mA	4	DC 110V
										Q	DC 4-20mA	5	DC 220V
										G	1 Pulse/WH	6	AC 90~260V
										R	SPECIFIED	9	SPECIFIED
													* ±10% of rate, less 5.5VA for AC switching input * ±20% of rate, less 4.5W for DC input

- Aux. power supply : AC110 & 220V  $\pm$  20% (50 or 60Hz)  
 $\leq$  4.5VA (Optional DC24, 48, 110, 220V, AC/DC 110/220V)  
switching AC 90~260V $\pm$ 10%
- Measuring accuracy : 0.25% F.S. (23  $\pm$ 5°C)
- Readout (compare) range : "0" to "9999" adjustable (watt)  
"0" to "999999999" adjustable (watt hour)
- Input burden :  $\leq$  0.2VA (Voltage);  $\leq$  0.2VA (Current)
- Max. input over : 3 x rated continuous (Current)  
2 x rated continuous (Voltage)
- Compare hysteresis range : "0" to "99" adjustable
- Alarm action : "Hi" to "Lo" adjustable (watt)
- Relay contact output : AC 250-3A, DC 30V-5A
- Parameter setting : Touch switches
- Temp. coefficient : 100ppm/°C (0-50°C)
- Display : Red high efficiency LEDs high  
9.2mm (0.36")
- Analog output resolution : 15 bit DAC
- Output ripple (p-p) :  $<$  0.1% F.S.
- Response time :  $\leq$  300ms (0-90%)
- Output drive capability :  $\leq$  10mA for voltage mode  
 $\leq$ 10V for current mode
- Dielectric strength : 2Kvac/1 min. (power/input & output)
- Surge test : ANSI C37.90/1974, DIN-IEC255-4  
impulse voltage 4KV (1.2x50 $\mu$ s)
- Operating condition : 0~50°C (20 to 90% RH non-condensed)
- Storage condition : 0~70°C (20 to 90% RH non-condensed)
- Memory type : Non-volatile EEPROM memory

Model		Element connection	Standard analog calibration (Watts or Vars)					
Watts	Vars		V = 120V		V = 240V		V = 400V	
			1A	5A	1A	5A	1A	5A
WWH1	VVH1	1Ø2W	100	500	200	1K	400	2K
WWH3	VVH3	3Ø3W	200	1K	400	2K	800	4K
WWH4	VVH4	3Ø4W	300	1.5K	600	3K	1.2K	6K

• PANEL CUT-OUT

92<sup>+0.8</sup><sub>-0</sub>

45<sup>+0.8</sup><sub>-0</sub>

7

125

13

145

S1

S2

ENT

▶

▲

POUNDFUL

9.2

48

9.2

96

OUT

M<sub>S</sub> M<sub>I</sub>

14 15 16 17 18 19 20 21

(+) (-)

LOAD

102W

M

N

SOURCE

1 2 3 4 5 6 7 8 9 10 11 12 13

P<sub>m</sub> P<sub>n</sub> c a c a

S1 S2

DC OPTION - +

220V 110V 0V

RST

OUT

A<sub>S</sub> A<sub>I</sub>

14 15 16 17 18 19 20 21

(+) (-)

LOAD

303W

A

B

C

SOURCE

1 2 3 4 5 6 7 8 9 10 11 12 13

P<sub>a</sub> P<sub>b</sub> P<sub>c</sub> c a c a

S1 S2

DC OPTION - +

220V 110V 0V

RST

OUT

A<sub>S</sub> A<sub>I</sub> B<sub>S</sub> B<sub>I</sub> C<sub>S</sub> C<sub>I</sub>

14 15 16 17 18 19 20 21

(+) (-)

LOAD

304W

A

B

C

N

SOURCE

1 2 3 4 5 6 7 8 9 10 11 12 13

P<sub>a</sub> P<sub>b</sub> P<sub>c</sub> P<sub>n</sub> c a c a

S1 S2

DC OPTION - +

220V 110V 0V

RST

# MICROPROCESS WATT & WATTHOUR (VAR & VARHOUR) CONTROLLER METER



## FEATURES

- Resolution of 5 digits rate and 10 digits totalizer simultaneously
- Accuracy 0.25% F.S.
- Automatic, external, or button totalizer reset
- Decimal point can be modified
- Programmable time base (1,60,3600 seconds)
- Programmable scale factor (0.00001 to 19999.99999)
- Dielectric strength 2KVac (input / output / power)
- Four alarms with hysteresis and delay functions (optional)
- 16 bit DAC analog output type can be modified (optional)
- RS485/ RS232 communication with Modbus RTU mode (optional)

## 1. MODEL: PF-M

NO	Input Type	NO	Input Unit	NO	Input Voltage	NO	Input Current	NO	Analog Output	NO	Alarm	NO	Pulse	NO	Communication (Modbus RTU)	NO	Aux. Power
WWHA	Watt/Watthour	1	1Ø2W	1	0-120V (85-150V)	1	0-1A (0-1.2A)	See analog output table		0	None	0	None	0	None	1	AC 90~240V
VVHA	Var/Varhour	3	3Ø3W	2	0-240V (180-300V)	2	0-5A (0-6A)			1	1 Alarm	1	Relay	1	RS485	2	DC 24~70V
		4	3Ø4W	3	0-400V (320-480V)	9	SPECIFIED			2	2 Alarms	2	Open Collector	2	RS232	3	AC/DC 24V
		9	SPECIFIED	9	SPECIFIED					3	3 Alarms					4	DC 110V
										4	4 Alarms*					9	SPECIFIED
																	≤ 15VA for AC ≤ 10W for DC

\*Pulse output unavailable if 4 alarms specified

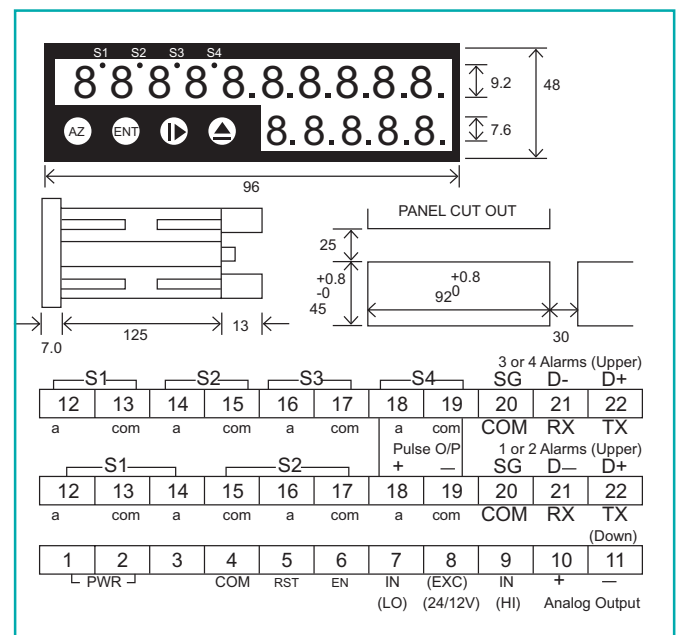
## 2. Specification

- Aux. power supply : AC 90~240V ± 10% 50/60 Hz  
DC 24~70V ± 10%  
AC/DC 24 ± 10%  
DC 110V ± 10% , DC 220V ± 10%
- Measure accuracy : 0.25% F.S. (23 ± 5°C )
- Input burden : ≤ 0.2VA (Voltage); ≤ 0.2VA (Current)
- Readout (compare) : "0" to "24999" adjustable (Watt / Var)  
"0" to "2147483647" adjustable (Watthour / Varhour)
- Alarm selection : Watt / Var and Watthour / Varhour can be modified
- Compare hysteresis range : "0" to "999" adjustable
- Alarm action : "Hi" or "Lo" adjustable
- Alarm relay contact output : AC 250V/ 3A DC 30V/5A
- Analog output resolution : Watt / Var or Watthour / Varhour can be modified
- Analog output resolution : 16 bit DAC (isolating)
- Output drive capability : ≤ 20mA for voltage mode  
≤ 14V for current mode
- Output ripple ( p-p ) : ≤ 0.1% F.S.
- Response time : < 250 ms (0-90 %)
- Pulse relay contact output : DC 100V / 0.5A ≤ 10VA
- Pulse open collector : ≤ DC 30V / 40mA
- Communication address : 2400, 4800, 9600, 19200 BPS
- RTU Data format : < 8,N,1>, < 8,N,2>, < 8,E,1>, < 8,O,1>
- Communication address : "1" to "247" can be modified
- Parameter setting : Touch switches
- Memory type : Non-volatile EEPROM
- Dielectric type : 2KVac/1min. (power / input / output)
- Temp. coefficient : 100ppm/°C (0-50°C)
- Operating condition : 0~50°C (20~90% RH non-condensed)
- Storage condition : 0~70°C (20~90% RH non-condensed)

## 4. Analog output table

X	Output Range	O/P Range 1-2-3-4-5-6	O/P Mode 7-8
0	SPECIFIED	switching status	on=1 off=0
1	0 ~ 1V	1-0-1-1-1-0	1-1
2	0 ~ 5V	1-0-1-0-1-0	1-1
3	1 ~ 5V	1-1-1-0-1-1	1-1
4	0 ~ 10V	1-1-0-1-0-0	1-1
5	2 ~ 10V	1-1-1-1-0-1	1-1
6	0 ~ 1mA	0-1-1-1-1-0	0-0
7	0 ~ 10mA	1-0-1-0-1-0	0-0
8	0 ~ 20mA	1-1-0-1-0-0	0-0
9	4 ~ 20mA	1-1-1-1-0-1	0-0

## 5. Dimension and connection diagram



## 3. Standard Analog Calibration Table(SAC)

See Page 68

# MULTI-FUNCTION DIGITAL POWER METER



## FEATURES

- True-RMS measurement for input waves
- Multi-measurement for various power systems
- Minimum and Maximum function
- Compact size: 96mm x 96mm
- Harmonic and THD display in basic version
- 4 quadrants energy display



## 1. MODEL: PFM - DPM

NO	Input Current	NO	OUT1	NO	OUT2	NO	OUT3	NO	OUT4	NO	Digital Communication	NO	Aux. Power
1	0-1A	N	None	N	None	N	None	N	None	N	None	1	AC 100~240V±10%
5	0-5A	A	Relay	A	Relay	A	Relay	A	Relay	A	RS485	2	DC 120~330V±10%
9	SPECIFIED	B	Reed Relay	B	Reed Relay	B	Reed Relay	B	Reed Relay	B	RS232	9	SPECIFIED
		C	Open Collector	C	Open Collector	C	Open Collector	C	Open Collector				
		D	0/4-20mA	D	0/4-20mA	D	0/4-20mA	D	0/4-20mA				

Note: Reed Relay and Open Collector are Pulse Output.

## 2. Specification

### • Accuracy

Current :  $\pm 0.25\%$ F.S., True RMS

Voltage :  $\pm 0.25\%$ F.S., True RMS

Power :  $\pm 0.5\%$ F.S.

Power Factor :  $\pm 1.0\%$

Frequency :  $\pm 0.02\text{Hz}$

• Frequency Range : 45-65Hz

• Temp. Coefficient : 100ppm/°C (0~50°C)

• Update Period : 1 second

### • Voltage Measurement

Direct : 0-1200Vac (Phase/Phase)

0-700Vac (Phase/Neutral)

Via PT : Up to 400KV(Primary)

### • Current Measurement

Primary : Up to 10000A

Secondary : 1 or 5 A

### • Max. Input over

Current Related Input : 3 x rated continuous

10 x rated 30 sec

25 x rated 3 sec

50 x rated 1 sec

Voltage Related Input : 2 x rated continuous

### • Input Burden

Voltage :  $\leq 0.1\text{VA}$

Current :  $\leq 0.2\text{VA}$

• Harmonic Analysis : Up to 15<sup>th</sup> harmonic

• THD display : Up to 31<sup>st</sup> harmonic

### • Power Consumption

90~240VAC :  $\leq 10\text{VA}$

120~330VDC :  $\leq 10\text{W}$

• Relay : C Form 220VAC/30VDC 3A

### • Pulse Output

Signal Type : Dry contact or open collector

Pulse Rate :  $< 5\text{Hz}$

• Reed Relay : A Form 100VDC 0.5A  $\leq 10\text{VA}$

• Open Collector :  $\leq 30\text{VDC}$  40mA

### • 0/4-20mA Output

Load Resistance : 600 $\Omega$

Response Time : 1s

Output Ripple(p-p) :  $\leq 0.1\%$ F.S.

### • Communication

RS485 : 2 or 3 wires half duplex

RS232 : 3 wires half duplex

Protocol : Modbus RTU mode

Speed : 2400/4800/9600/19200/38400

• Operating Temperature : 0~55°C (20~95% non-condensed)

• Storage Temperature : -10~70°C (20~95% non-condensed)

• Display Type : High luminosity LCD display

### • Standards Compliance

Dielectric Strength : DIN-IEC 688 (2KVac50/60Hz/1min)

Impulse Test : IEC 255-4 (5KV 1.2x50 $\mu\text{s}$ )

# MULTI-FUNCTION DIGITAL POWER METER

Parameter	Accuracy ( %FS)	Resolution	Range
Volts	± 0.25%	4 Digits	0.000 V ~ 780.0 KV <sup>*1</sup>
Amps & Amps Demand	± 0.25%	4 Digits	0.000 A ~ 10.00 KA <sup>*1</sup>
KW & KW Demand	± 0.5%	4 Digits	0.000 W ~ 780.0 MW <sup>*1</sup>
KVAR & KVAR Demand	± 0.5%	4 Digits	0.000 VAR ~ 780.0 MVAR <sup>*4</sup>
KVA & KVA Demand	± 0.5%	4 Digits	0.000 VA ~ 780.0 MVA <sup>*5</sup>
KWH	± 0.5%	8 Digits	0.0000 ~ 99,999,999 KWH
KVARH	± 0.5%	8 Digits	0.0000 ~ 99,999,999 KVARH
KVAH	± 0.5%	8 Digits	0.0000 ~ 99,999,999 KVAH
Power Factor	± 1.0%	0.01	± 0.00 ~ 1.00
Frequency	± 0.02Hz	0.01Hz	45.00 ~ 65.00 Hz
Volts THD <sup>*6</sup>	± 2.5%	0.1%	0.0 ~ 100.0%
Amps THD <sup>*6</sup>	± 2.5%	0.1%	0.0 ~ 100.0%

<sup>\*1</sup> Reads in Kilovolts over 1000V

<sup>\*2</sup> Reads in Kiloamps over 1000A

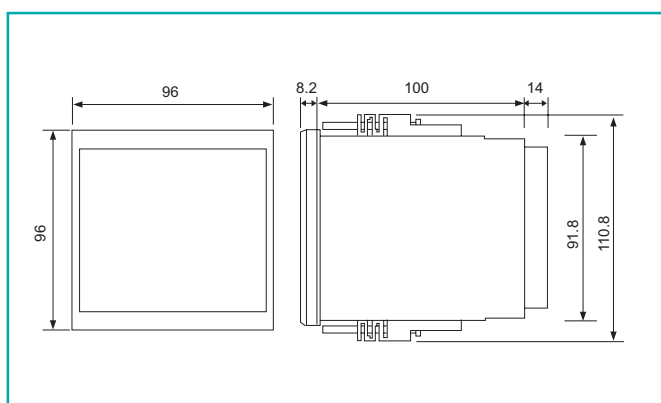
<sup>\*3</sup> Reads in Kilowatts over 1000W and Megawatts over 1000KW

<sup>\*4</sup> Reads in Kilovars over 1000VAR and Megavars over 1000KVAR

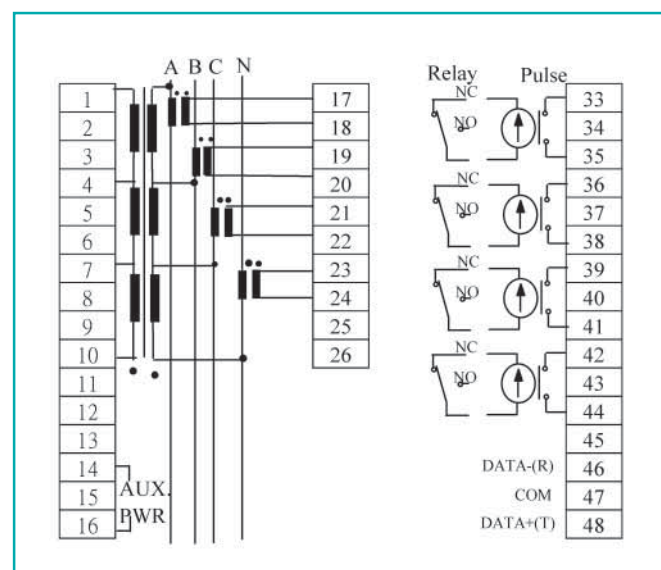
<sup>\*5</sup> Reads in KiloVA over 1000V and MegaVA over 1000KVA

<sup>\*6</sup> THD: Total Harmonic Distortion

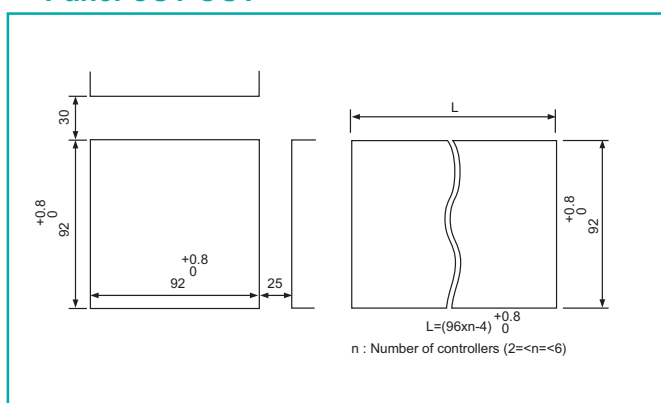
## 3. Dimension: (Unit: mm)



## 4. Terminal connection



## Panel CUT-OUT



# AC CURRENT & VOLTAGE TRANSDUCER (self-powered)



## FEATURES

- Measuring & Conversion : DIN-IEC 688
- Dielectric Strength : DIN-IEC 688  
2KVac 50 / 60Hz / 1 minute
- Impulse Test : ANSI C37.90a / 1974,  
IEEE 587 / 1983,  
IEC 255-4, 5KV (1.2 x 50μs)
- Surge test (ring wave) : IEC 255-4 (2.5KV~0.25ms / 1MHz)

## 1. MODEL: PF - PAN

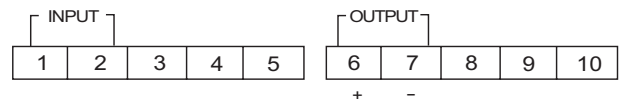
NO	Input Unit	NO	Input Type	NO	Input Rating (range)	NO	Frequency	NO	Output Voltage	NO	Output Current
1	1 unit	A	Voltage	1	AC 0~150V (30~150V)	A	50Hz	11	※ DC 0-1 V	21	DC 0-1mA
3	3 units	C	Current	2	AC 0~300V (60~300V)	B	60Hz	12	※ DC 0-5 V	22	DC 0-5mA
				3	AC 0~500V (100~500V)	C	400Hz	13	※ DC 0-10 V	23	DC 0-10mA
				4	AC 0~1A	• Frequency ±10%		19	※ SPECIFIED	24	DC 0-20mA
				5	AC 0~5A			※ For Voltage Input Type Only			

## 2. Specification

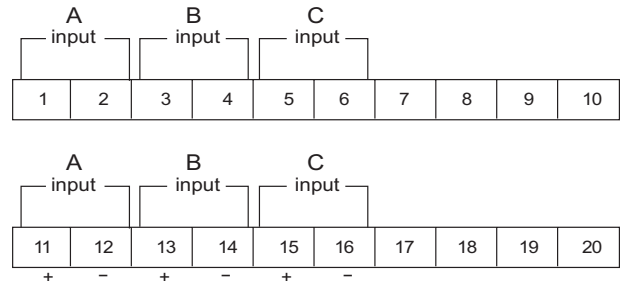
- Accuracy : 0.25% F.S. (RMS) (23±5°C)
- Temp. coefficient : 100ppm/°C (0-50°C)
- Input burden : ≤ 0.2VA
- Maximum input over : Current related input: 3 x rated continuous  
10 x rated 30 sec., 25 x rated 3 sec.,  
50 x rated 1 sec.  
Voltage related input: maximum 2 x rated continuous
- Response time : ≤250ms (0-90%)
- Output ripple (p-p) : < 0.1% F.S.
- Output drive capability : ≤10mA for voltage mode  
≤10V for current mode
- Dielectric strength : 2KVac/1 min. (Input/output/case)
- Surge test : ANSI C37.90a/1974, DIN-IEC 255-4  
impulse voltage 5KV (1.2 x 50μs)
- Operating condition : 0~55°C (20 to 90% RH non-condensed)
- Storage condition : 0~70°C (20 to 90% RH non-condensed)
- Power Supply : No auxiliary power required

## 4. Terminal connection

### PAN-1 (1 unit)

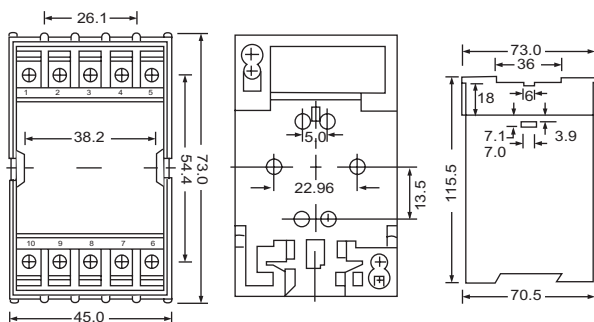


### PAN-3 (3 units)

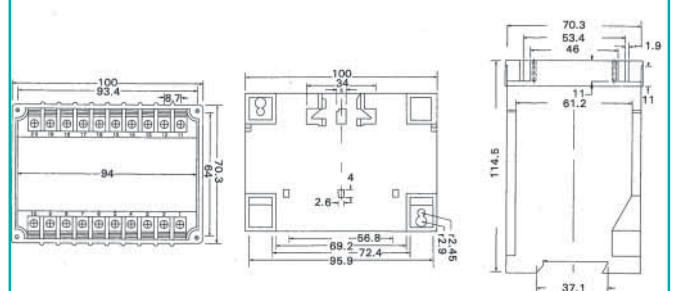


## 3. Dimension: (Unit: mm)

### PAN-1



### PAN-3





# AC CURRENT & VOLTAGE TRANSDUCER



## FEATURES

- Measuring & Conversion : DIN-IEC 688
- Dielectric Strength : DIN-IEC 688  
2KVac 50 / 60Hz / 1 minute
- Impulse Test : ANSI C37.90a / 1974,  
IEEE 587 / 1983,  
IEC 255-4, 5KV (1.2 x 50 $\mu$ s)
- Surge test (ring wave) : IEC 255-4 (2.5KV-0.25ms / 1MHz))

## 1. MODEL: PF - PA - [Color] - [Color] - [Color] - [Color]

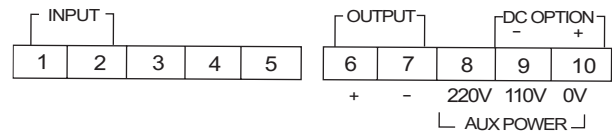
NO	Input Unit	NO	Input Type	NO	Input Rating (range)	NO	Frequency	NO	Output Voltage	NO	Output Current	NO	Aux. Power
1	1 unit	A	Voltage (RMS)	1	AC 0~120V (0~150V)	A	50Hz	11	DC 0-1 V	21	DC 0-1mA	1	AC 110/220V(50/60Hz)
3	3 units	B	Voltage (TRMS)	2	AC 0~240V (0~300V)	B	60Hz	12	DC 0-5 V	22	DC 0-10mA	2	DC 24V
		C	Current (RMS)	3	AC 0~400V (0~480V)	C	400Hz	13	DC 1-5 V	23	DC 0-20mA	3	DC 48V
		D	Current (TRMS)	4	AC 0~1A (0~1.2A)	0	SPECIFIED	14	DC 0-10 V	24	DC 4-20mA	4	DC 110V
		0	SPECIFIED	5	AC 0~5A (0~6A)			15	DC 2-10 V	29	SPECIFIED	5	DC 220V
			• TRMS only PA1	9	SPECIFIED		• Frequency $\pm 10\%$	19	SPECIFIED			6	AC 90~260V
												9	SPECIFIED

## 2. Specification

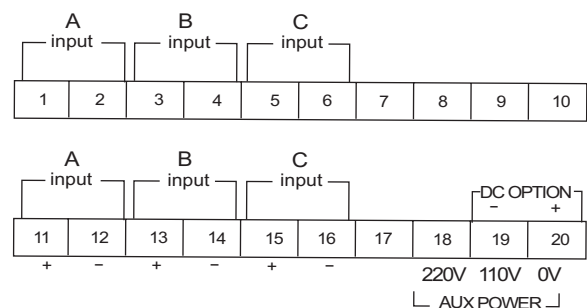
- Accuracy : 0.1% F.S. (TRMS) (23 $\pm$ 5°C)  
0.25% F.S. (RMS) (23 $\pm$ 5°C)
- Temp. coefficient : 100ppm/°C (0-50°C)
- Input burden :  $\leq 0.2VA$  (voltage)  $\leq 0.2VA$  (current)
- Maximum input over : Current related input: 3 x rated continuous  
10 x rated 30 sec., 25 x rated 3 sec.,  
50 x rated 1 sec.  
Voltage related input: maximum 2 x rated continuous
- Response time :  $\leq 250ms$  (0-90%)
- Output ripple (p-p) :  $< 0.1\%$  F.S.
- Output drive capability :  $\leq 10mA$  for voltage mode  
 $\leq 10V$  for current mode
- Dielectric strength :  $\leq 2KVac/1$  min. (Input/output/aux. power/ case)
- Surge test : ANSI C37.90a/1974, DIN-IEC 255-4  
impulse voltage 5KV (1.2 x 50 $\mu$ s)
- Operating condition : 0~55°C (20 to 95% RH non-condensed)
- Storage condition : 0~70°C (20 to 95% RH no-condensed)
- Power Supply : AC 110V/220V  $\pm 20\%$  (50/60Hz)  
 $\leq 2VA$  (PA1),  $\leq 3.5VA$  (PA3)  
(Optional DC24V, DC48V, DC110V,  
DC220V  $\pm 20\%$ )

## 4. Terminal connection

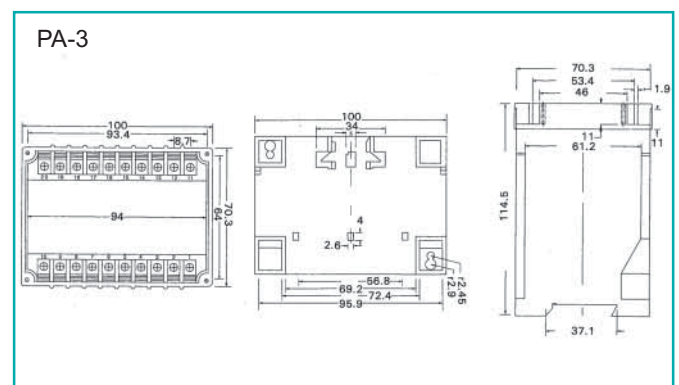
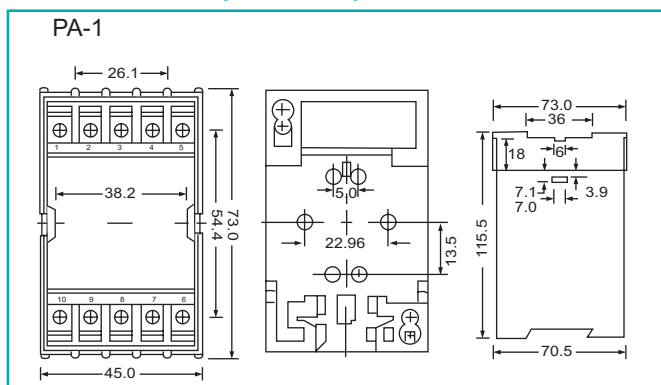
### PA-1 (1 units)



### PA-3 (3 units)



## 3. Dimension: (Unit: mm)



# FREQUENCY TRANSDUCER



## FEATURES

- Measuring & Conversion : DIN-IEC 688
- Dielectric Strength : DIN-IEC 688  
2KVac 50 / 60Hz / 1 minute
- Impulse Test : ANSI C37.90a / 1974,  
IEEE 587 / 1983,  
IEC 255-4, 5KV (1.2 x 50 $\mu$ s)
- Surge test (ring wave) : IEC 255-4 (2.5KV~0.25ms / 1MHz)

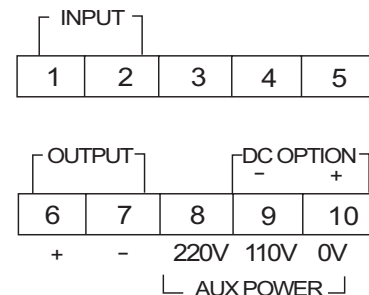
## 1. MODEL: PF - PF - - -

NO	Input Frequency	NO	Output Voltage	NO	Output Current	NO	Aux.Power
A	45-55Hz	11	DC 0-1 V	21	DC 0-1 mA	1	AC 110/220V(50/60Hz)
B	55-65Hz	12	DC 0-5 V	22	DC 0-10mA	2	DC 24V
C	45-65Hz	13	DC 1-5 V	23	DC 0-20mA	3	DC 48V
O	SPECIFIED	14	DC 0-10 V	24	DC 4-20mA	4	DC 110V
• Sensing voltage AC 30-600V		15	DC 2-10 V	29	SPECIFIED	5	DC 220V
		19	SPECIFIED			6	AC 90~260V
						9	SPECIFIED

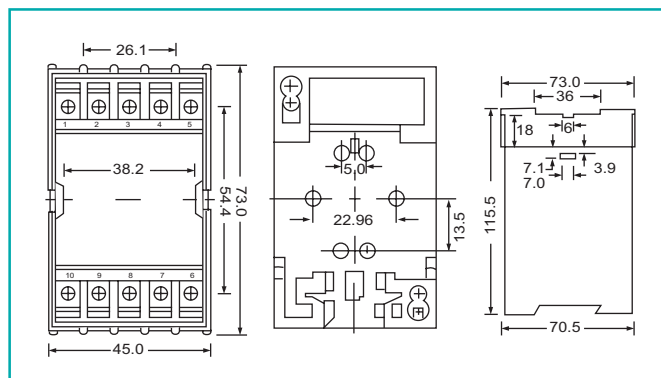
## 2. Specification

- Accuracy : 0.1% F.S. (23 $\pm$ 5°C)
- Temp. coefficient : 50 ppm/°C (0-50°C)
- Input burden :  $\leq$ 0.2VA
- Maximum input over : maximum 2 x rated continuous
- Response time :  $\leq$ 250ms (0~90%)
- Output ripple (p-p) : <0.1% F.S.
- Output drive capability :  $\leq$ 10mA for voltage mode  
 $\leq$ 10V for current mode
- Dielectric strength : 2KVac/1 min. (input/output/aux. power/case)
- Surge test : ANSI C37.90a/1974, DIN-IEC 255-4  
impulse voltage 5KV (1.2 x 50 $\mu$ s)
- Operating condition : 0~55°C (20~95% RH non-condensed)
- Storage condition : 0~70°C (20~95% RH non-condensed)
- Power supply : AC 110V/220V  $\pm$ 20% (50/60Hz) $\leq$ 2VA  
(Optional DC24V, DC48V, DC110V, DC220V $\pm$ 20%)

## 4. Terminal connection



## 3. Dimension: (Unit: mm)



# WATT & VAR TRANSDUCER



## FEATURES

- Measuring & Conversion
- Dielectric Strength
- Impulse test
- Surge test (ring wave)

DIN-IEC 688  
DIN-IEC 688  
2 KVac 50/60Hz/1 minute  
ANSI C37.90a/1974,  
IEEE 587/1983,  
IEC 255-4, 5 KV(1.2x50 $\mu$ s)  
IEC 255-4  
(2.5KV-0.25ms/1 MHz)

## 1. MODEL: PF-P

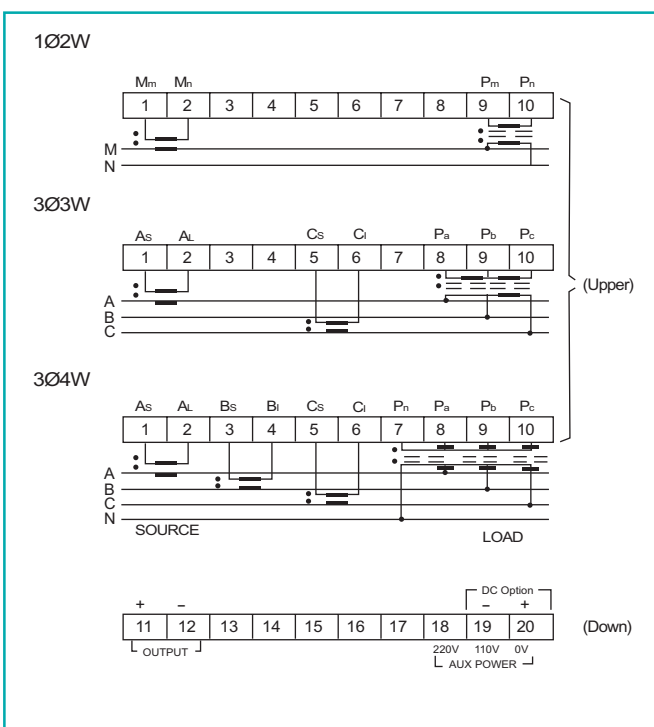
NO	Type	NO	Input Unit	NO	Voltage Rating (range)	NO	Current Rating (range)	NO	Frequency	NO	Output Voltage	NO	Output Current	NO	Aux. Power
W	Watt	1	1 $\emptyset$ 2W	1	0-120V (85-150V)	1	0-1 A (0-1.2A)	A	50 Hz	11	DC 0-1 V	21	0-1mA	1	AC 110/220V(50/60Hz)
V	Var	3	3 $\emptyset$ 3W	2	0-240V (180-300V)	2	0-5 A (0-6A)	B	60 Hz	12	DC 0-5 V	22	0-10mA	2	DC 24V
		4	3 $\emptyset$ 4W	3	0-400V (320-480V)	9	SPECIFIED	C	400 Hz	13	DC 1-5V	23	0-20mA	3	DC 48V
		9	SPECIFIED	9	SPECIFIED			0	SPECIFIED	14	DC 0-10 V	24	4-20mA	4	DC 110V
									• Frequency $\pm$ 10%	15	DC 2-10 V	29	SPECIFIED	5	DC 220V
										19	SPECIFIED			6	AC 90~260V
														9	SPECIFIED

## 2. Specification

- Accuracy : 0.25% F.S. (23  $\pm$ 5 $^{\circ}$ C)
- Temp. coefficient : 100ppm/ $^{\circ}$ C (0-50 $^{\circ}$ C)
- Input burden :  $\leq$  0.2VA (Voltage)  
 $\leq$  0.2VA (Current)
- Maximum input over : Current related input: 3 x rated continuous,  
10 x rated 30sec, 25 x rated 3 sec,  
50 x rated 1 sec  
Voltage related input: maximum  
2 x rated continuous
- Response time :  $\leq$  250ms (0-90%)
- Output ripple (p-p) :  $<$  0.1% F.S.
- Output drive capability :  $\leq$  10mA for voltage mode  
 $\leq$  10V for current mode
- Dielectric strength : 2KVac/1 min. (input/output/aux. power/case)
- Surge test : ANSI C37.90a/1974, DIN-IEC 255-4  
impulse voltage 5KV (1.2x50 $\mu$ s)
- Operating condition : 0~50 $^{\circ}$ C (20 to 95% RH non-condensed)
- Storage condition : 0~70 $^{\circ}$ C (20 to 95% RH non-condensed)
- Power supply : AC 110V/220V  $\pm$ 20% (50/60Hz) $\leq$ 3.5VA  
(Optional DC24V, DC48V, DC110V, DC220V $\pm$ 20%)

Model		Element connection	Standard analog calibration (Watts or Vars)					
Watts	Vars		V = 120V		V = 240V		V = 400V	
			1A	5A	1A	5A	1A	5A
PW1	PV1	1Ø2W	100	500	200	1K	400	2K
PW3	PV3	3Ø3W	200	1K	400	2K	800	4K
PW4	PV4	3Ø4W	300	1.5K	600	3K	1.2K	6K

## 4. Terminal Connection



## 3. Dimension: See Page-99 Transducer Dimension

# WATTHOUR & VARHOUR TRANSDUCER



## FEATURES

- Measuring & Conversion
- Dielectric Strength
- Impulse test
- Surge test (ring wave)

DIN-IEC 688  
DIN-IEC 688  
2 KV<sub>ac</sub> 50/60Hz/1 minute  
ANSI C37.90a/1974,  
IEEE 587/1983,  
IEC 255-4, 5 KV(1.2x50μs)  
IEC 255-4  
(2.5KV-0.25ms/1 MHz)

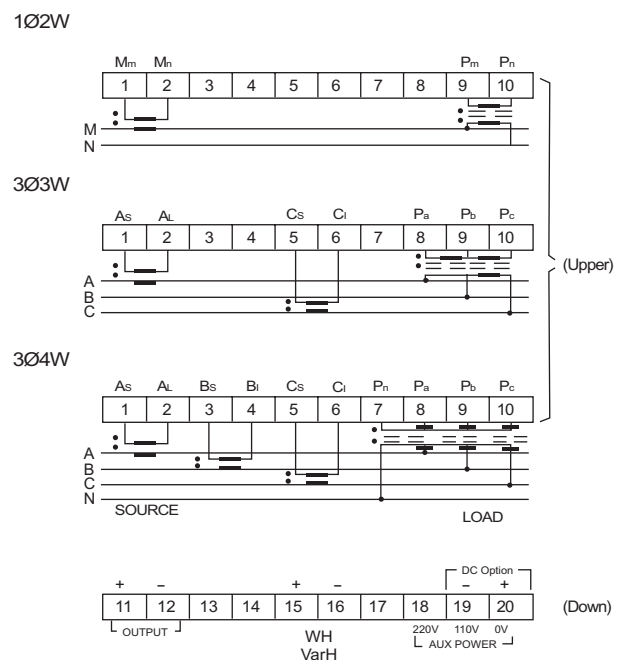
## 1. MODEL: PF-P - - - -

NO	Type	NO	Input Unit	NO	Voltage Rating (range)	NO	Current Rating (range)	NO	Frequency	NO	Output Pulse	NO	Aux. Power
WH	WATT	1	1Ø2W	1	0-120V (85-150V)	1	0-1 A (0-1.2A)	A	50 Hz	1	1wh or varh/count	1	AC 110/220V(50/60Hz)
VH	VAR	3	3Ø3W	2	0-240V (180-300V)	2	0-5 A (0-6A)	B	60 Hz	2	10wh or varh/count	2	DC 24V
		4	3Ø4W	3	0-400V (320-480V)	9	SPECIFIED	C	400 Hz	3	100wh or varh/count	3	DC 48V
		9	SPECIFIED	9	SPECIFIED			0	SPECIFIED	4	1000wh or varh/count	4	DC 110V
									• Frequency±10%	9	SPECIFIED	5	DC 220V
												6	AC 90~260V
												9	SPECIFIED

## 2. Specification

- Accuracy : 0.25% F.S. (23 ±5°C)
- Temp. coefficient : 100ppm/°C (0-50°C)
- Input burden : ≤ 0.2VA (Voltage)  
≤ 0.2VA (Current)
- Maximum input over : Current related input : 3 x rated continuous,  
10 x rated 30sec, 25 x rated 3 sec,  
50 x rated 1 sec  
Voltage related input: maximum  
2 x rated continuous
- Response time : ≤ 250ms (0-90%)
- Output ripple (p-p) : < 0.1% F.S.
- Output of WH or VarH : Open collector type, max. 50V/30mA or  
reed relay DC100V/0.5A ≤10VA
- Dielectric strength : 2KV<sub>ac</sub>/1 min. (input/output/aux.  
power/case)
- Surge test : ANSI C37.90a/1974, DIN-IEC 255-4  
impulse voltage 5KV (1.2x50μs)
- Operating condition : 0~50°C (20 to 95% RH non-condensed)
- Storage condition : 0~70°C (20 to 95% RH non-condensed)
- Power supply : AC 110V/220V ±20% (50/60Hz)≤3.5VA  
(Optional DC24V, DC48V, DC110V,  
DC220V±20%)

## 4. Terminal Connection



Model		Element connection	Standard analog calibration (Watts or Vars)					
Watts	Vars		V = 120V		V = 240V		V = 400V	
			1A	5A	1A	5A	1A	5A
PWH1	PVH1	1Ø2W	100	500	200	1K	400	2K
PWH3	PVH3	3Ø3W	200	1K	400	2K	800	4K
PWH4	PVH4	3Ø4W	300	1.5K	600	3K	1.2K	6K

## 3. Dimension: See Page-99 Transducer Dimension

# WATT WATTHOUR & VAR VARHOUR TRANSDUCER



## FEATURES

- Measuring & Conversion
- Dielectric Strength
- Impulse test
- Surge test (ring wave)

DIN-IEC 688  
DIN-IEC 688  
2 KV<sub>ac</sub> 50/60Hz/1 minute  
ANSI C37.90a/1974,  
IEEE 587/1983,  
IEC 255-4, 5KV(1.2x50μs)  
IEC 255-4  
(2.5KV-0.25ms/1 MHz)

## 1. MODEL: PF-P

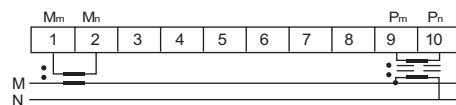
NO	Type	NO	Input Unit	NO	Voltage Rating (range)	NO	Current Rating (range)	NO	Frequency	NO	Output Voltage	NO	Output Current	NO	Output Pulse	NO	Aux. Power
WWH	WATT	1	1Ø2W	1	0-120V (85-150V)	1	0-1 A (0-1.2A)	A	50 Hz	11	DC 0-1 V	21	0-1mA	1	1wh or varh/count	1	AC 110/220V(50/60Hz)
VVH	VAR	3	3Ø3W	2	0-240V (180-300V)	2	0-5 A (0-6A)	B	60 Hz	12	DC 0-5 V	22	0-10mA	2	10wh or varh/count	2	DC 24V
		4	3Ø4W	3	0-400V (320-480V)	9	SPECIFIED	C	400 Hz	13	DC 1-5V	23	0-20mA	3	100wh or varh/count	3	DC 48V
		9	SPECIFIED	9	SPECIFIED			0	SPECIFIED	14	DC 0-10 V	24	4-20mA	4	1000wh or varh/count	4	DC 110V
									• Frequency±10%	15	DC 2-10 V	29	SPECIFIED	9	SPECIFIED	5	DC 220V
										19	SPECIFIED					6	AC 90-260V
																9	SPECIFIED

## 2. Specification

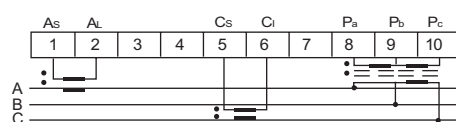
- Accuracy : 0.25% F.S. (23 ±5°C))
- Temp. coefficient : 100ppm/°C (0-50°C)
- Input burden : ≤ 0.2VA (Voltage)  
≤ 0.2VA (Current)
- Maximum input over : Current related input : 3 x rated continuous, 10 x rated 30sec,  
25 x rated 3 sec, 50 x rated 1 sec  
Voltage related input: maximum  
2 x rated continuous
- Response time : ≤ 250ms (0-90%)
- Output ripple (p-p) : < 0.1% F.S.
- Output drive capability : ≤ 10mA for voltage mode  
≤ 10V for current mode
- Output of WH or VarH : Open collector type, max. 50V/30mA or  
reed relay DC100V/0.5A≤10VA
- Dielectric strength : 2KV<sub>ac</sub>/1 min. (input/output/aux.  
power/case)
- Surge test : ANSI C37.90a/1974, DIN-IEC 255-4  
impulse voltage 5KV (1.2x50μs)
- Operating condition : 0~50°C (20 to 95% RH non-condensed)
- Storage condition : 0~70°C (20 to 95% RH non-condensed)
- Power supply : AC 110V/220V± 20% (50 /60Hz) ≤ 3.5VA  
(Optional DC24V, DC48V, DC110V,  
DC220V ± 20%)

## 4. Terminal Connection

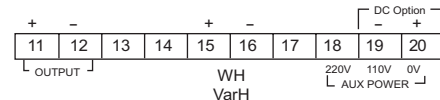
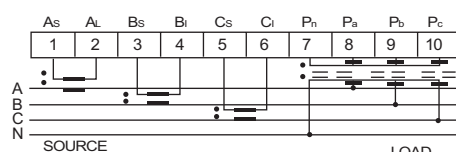
1Ø2W



3Ø3W



3Ø4W



Model		Element connection	Standard analog calibration (Watts or Vars)					
Watts	Vars		V = 120V		V = 240V		V = 400V	
			1A	5A	1A	5A	1A	5A
PWWH1	PVVH1	1Ø2W	100	500	200	1K	400	2K
PWWH3	PVVH3	3Ø3W	200	1K	400	2K	800	4K
PWWH4	PVVH4	3Ø4W	300	1.5K	600	3K	1.2K	6K

## 3. Dimension: See Page-99 Transducer Dimension

# POWER FACTOR (COS $\theta$ ) TRANSDUCER



## FEATURES

- Measuring & Conversion DIN-IEC 688
- Dielectric Strength DIN-IEC 688
- Impulse test 2 KV<sub>ac</sub> 50/60Hz/1 minute  
ANSI C37.90a/1974,  
IEEE 587/1983,  
IEC 255-4, 5KV(1.2x50 $\mu$ s)
- Surge test (ring wave) IEC 255-4  
(2.5KV-0.25ms/1 MHz)

## 1. MODEL: PF-PPF - - - - - / DN

NO	Input Unit (range)	NO	Voltage Rating (range)	NO	Current Rating	NO	Frequency	NO	Output Voltage	NO	Output Current	NO	Aux.Power
1	1 $\emptyset$ 2W	1	0-120V (85-150V)	1	0-1 A (0-1.2A)	A	50 Hz	11	DC 0-1V	21	DC 0-1mA	1	AC 110/220V(50/60Hz)
3	3 $\emptyset$ 3W	2	0-240V (180-300V)	2	0-5 A (0-6A)	B	60 Hz	12	DC 0-5V	22	DC 0-10mA	2	DC 24V
4	3 $\emptyset$ 4W	3	0-400V (320-480V)	9	SPECIFIED	C	400 Hz	13	DC 1-5V	23	DC 0-20mA	3	DC 48V
9	SPECIFIED	9	SPECIFIED			0	SPECIFIED	14	DC 0-10V	24	DC 4-20mA	4	DC 110V
							* Frequency $\pm$ 10%	15	DC 2-10V	29	SPECIFIED	5	DC 220V
								19	SPECIFIED			6	AC 90-260V
												9	SPECIFIED

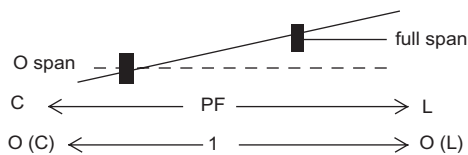
## Calibration: Dn

D1: 0.5(C) to 1 vs  
0 to full span output

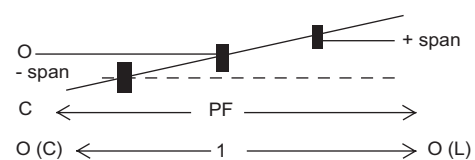
D2: 0(C) to 1 vs  
0 to full span output

D3: 0.5(C) to 1 to 0.5(L) vs  
0 to 1/2 span to full span output

D4: 0(C) to 1 to 0(L) vs  
0 to 1/2 span to full span output



Note: (C): capacitive load (L): inductive load



Note: (C): capacitive load (L): inductive load

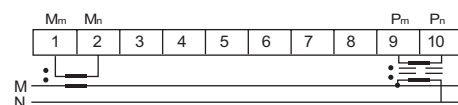
## 2. Specification

- Accuracy : 0.25% F.S. $\pm$ 0.25° (23  $\pm$ 5°C)
- Temp. coefficient : 100ppm/°C (0-50°C)
- Input burden :  $\leq$  0.2VA (Voltage)  
 $\leq$  0.2VA (Current)
- Maximum input over : Current related input : 3 x rated continuous,  
10 x rated 30 sec, 25 x rated 3 sec,  
50 x rated 1 sec  
Voltage related input: maximum  
2 x rated continuous
- Response time :  $\leq$  250ms (0-90%)
- Output ripple (p-p) :  $<$  0.1% F.S.
- Output drive capability :  $\leq$  10mA for voltage mode  
 $\leq$  10V for current mode
- Dielectric strength : 2KV<sub>ac</sub>/1 min. (input/output/aux.  
power/case)
- Surge test : ANSI C37.90a/1974, DIN-IEC 255-4  
impulse voltage 5KV (1.2x50 $\mu$ s)
- Operating condition : 0~50°C (20 to 95% RH non-condensed)
- Storage condition : 0~70°C (20 to 95% RH non-condensed)
- Power supply : AC 110V/220V  $\pm$  20% (50/60Hz)  $\leq$  3.5VA  
(Optional DC24V, DC48V, DC110V,  
DC220V  $\pm$  20%)

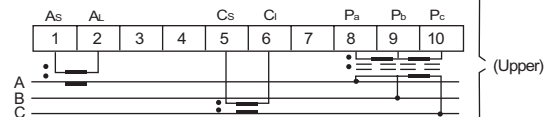
## 3. Dimension: See Page-99 Transducer Dimension

## 4. Terminal Connection

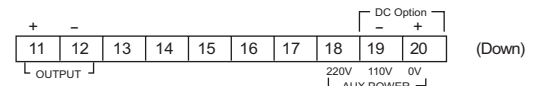
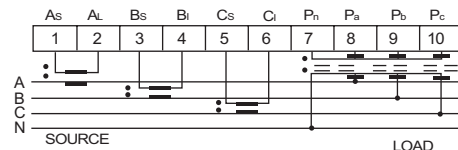
1 $\emptyset$ 2W



3 $\emptyset$ 3W



3 $\emptyset$ 4W





# COMMUNICATION METER



## FEATURES

- Communication Type: RS-485 ( 2-wire ), Baud Rate: 2400/4800/9600/19200
- Display: 5-digit seven segment LED
- Display range: -19999~99999, Decimal point Programmable
- Auxiliary power: AC 110V /220V
- Protocol: ASCII command format

## 1. MODEL: PF - D485

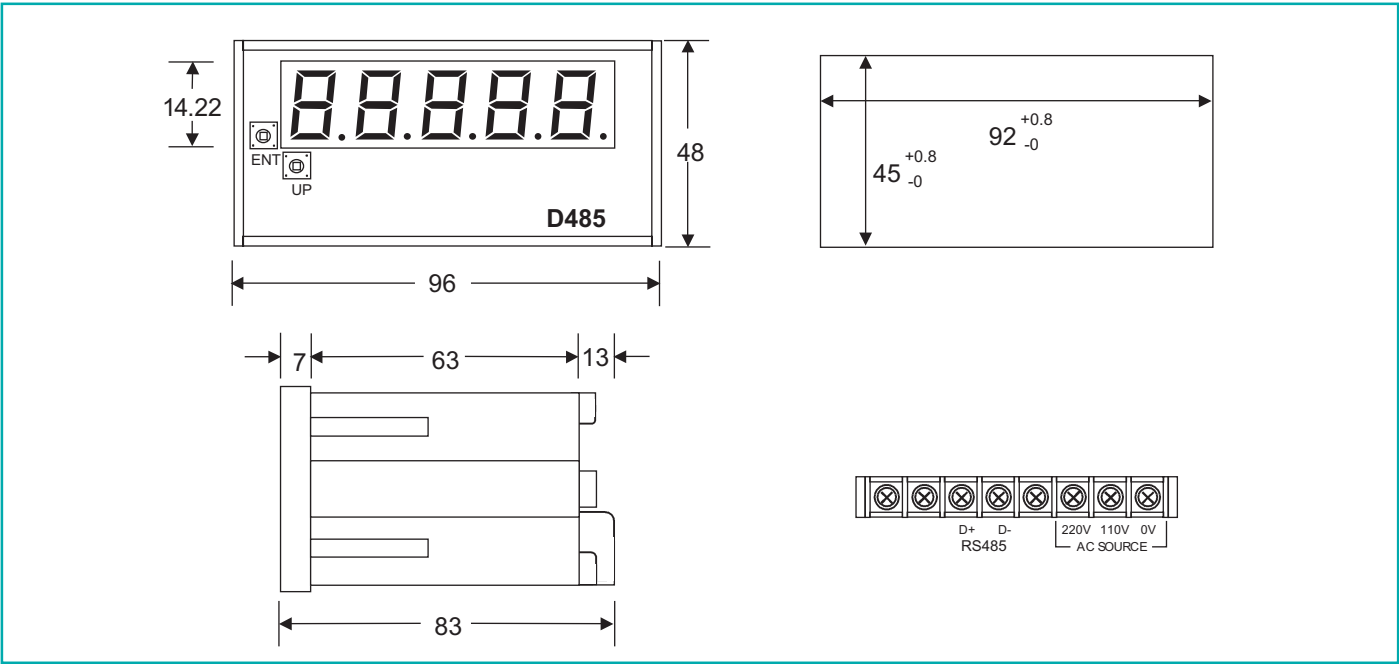
### Command Set:

Command Syntax	Command Name	Command Description
\$AA	Return Display Value	Return the display value from a specified slave device
%AA (Data)	Set Display Value	Set the display value of the specified slave device.

## 3. Specification

- Aux. power supply : AC110&220V±20% (50 or 60Hz)  
(optional DC24V or 48V or 110V or 220V  
switching AC 90—260V ±10%)
- Readout range : -19999~99999
- Display : Red high efficiency LEDs high 14.22mm
- Protocol : ASCII command format
- Communication type : RS485 (2-wire)
- Baud rate : 2400/4800/9600/19200
- Temperature coefficient : 100ppm/°C (0-50°C)
- Dielectric strength : 1.5Kvac/min (input/power)
- Operating condition : 0-50°C (20 to 90% RH non condensed)
- Storage condition : 0-70°C (20 to 90% RH non condensed)

## 4. Dimension and connection diagram



# RS232 TO RS485/422 ISOLATION CONVERTER



## FEATURES

- Built-in microprocessor
- Auto baud rate
- Auto tune-up to 115.2Kbps
- Power reverse protection
- Networking up to 1200m
- Power and data flowing indicator

## 1. MODEL: PF - RS - ■

- A = RS 232 to RS485/422
- B = RS422/485 repeater

## 2. Specification

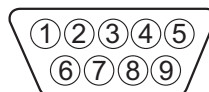
- Communication speed (bps) : 300, 600, 1299, 2400, 4800, 9600  
19.2K, 38.4K, 57.6K, 115.2K  
(Auto baud rate)
- RS232 connector : Female DB-9
- RS485/422 connector : Plug-in screw terminal
- Temp. coefficient : 100ppm/°C
- Dielectric strength : 3.0KVac/1Min (power/input/output)
- Operating condition : 0 ~ 55°C (20 ~ 90% RH  
non-condensed)
- Storage condition : 0 ~ 70°C (20 ~ 90% RH  
non-condensed)
- Installation : DIN rail or panel mounting
- Auxiliary power : 10 ~ 30VDC PF-RS-A 1.6W  
PF-RS-B 2.0W

## 4. Terminal connection

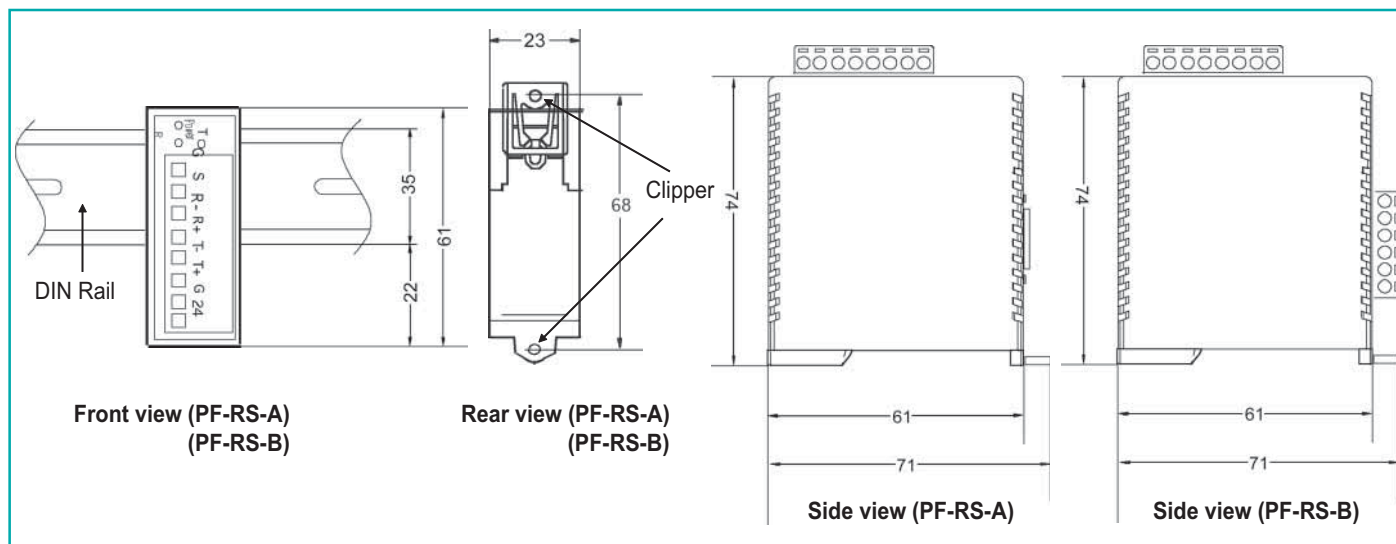
PIN	Description
T+	RS485 Data + RS422 Data Transmission +
T-	RS485 Data - RS422 Data Transmission -
R+	RS422 Data Receive +
R-	RS422 Data Receive -
S	Shield
G	Ground
24	+24VDC

## DB-9

PIN	Name	Description
1	DCD	Data Carrier Detect
2	RD	Receive Data (a.k.a RxD, Rx)
3	TD	Transmit Data (a.k.a TxD, Tx)
4	DTR	Data Terminal Ready
5	SGND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicator



## 3. Dimension



# DATA ACQUISITION MODULES



## FEATURES

- Universal input channel
- Field isolation upgradeable
- Baud rate selectable
- Modbus RTU protocol
- Compact design,

## 1. MODEL: PF - DAM - ■

No	Model ID	Description	No of Channel	Signal Type	Power Consumption	Specific Feature
1	@ IO_UI_08	Universal Analog Input	8	High level: 0-20mA, 4-20mA 0-5V, 1-5V, 0-10V Low level: -150mv ~ 150mv T/C: J: -210 ~ 1200°C K: -270 ~ 1370°C T: -270 ~ 400°C E: -270 ~ 1000°C R: -50 ~ 1760°C S: -50 ~ 1760°C B: 0°C ~ 1820°C N: -270 ~ 1300°C RTD: PT100 (DIN) -200°C ~ 850°C	24VDC, 120mA	Field upgradable Isolated Input
2	@ IO_AI_08	Analog Input	8	Current: 0-20mA, 4-20mA Voltage: 0-10V, 0-5V, 1-5V	24VDC, 120mA	Field upgradable Isolated Output
3	@ IO_AO_02	Analog Output	2	Current: 0-20mA, 4-20mA Voltage: 0-10V, 0-5V, 1-5V	24VDC, 160mA	Field upgradable Isolated Output
4	@ IO_DI_16	Digital Input	16	24V DC Sink	24VDC, 130mA	
5	@ IO_DO_PR_08	Power Relay Digital Output	8	Power Relay 220VAC (30VDC) 2A Load	24VDC, 120mA	
6	@ IO_DIO_16	Digital Input / Output	DI: 8 DO: 8	DI: 24VDC Sink DO: 24VDC Source, 0.5A	24VDC, 140mA	
7	@ IO_CI_02	Counter Input	CI: 2 DOPR: 4	DI: 24VDC Sink DO: Power Relay 220VAC (30VDC) 2A Load	24VDC, 92mA	
8	@ IO_PWR_24	24V Power Supply		Output: 24V, 1.2A	85-265VAC, 47-63HZ	

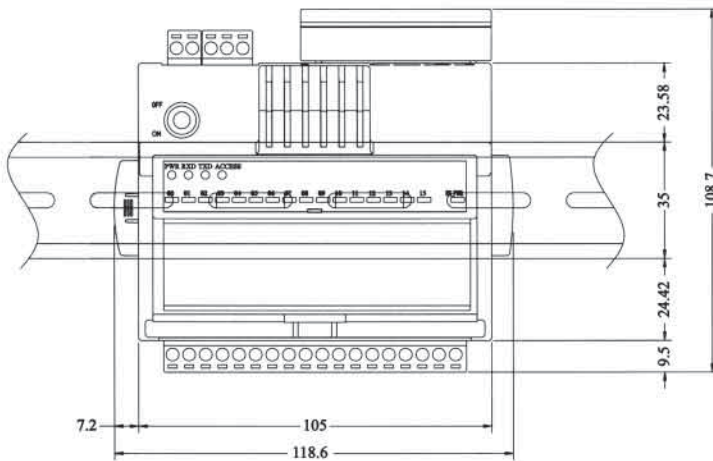
## 2. Specification

MODEL ID	DESCRIPTION	SPECIFICATION
@ EM_RS485_Isolated	Isolated RS485 Module	Voltage Isolation: 1000VAC
@ EM_UI_Isolated	Isolated UI Input Module	Channel to Channel Isolation: 350VAC/DC Channel to System Isolation: 1000VAC/DC
@ EM_AO_Isolated	Isolated AO Output Module	Channel to Channel Isolation: 1000VAC/DC Channel to System Isolation: 1000VAC/DC

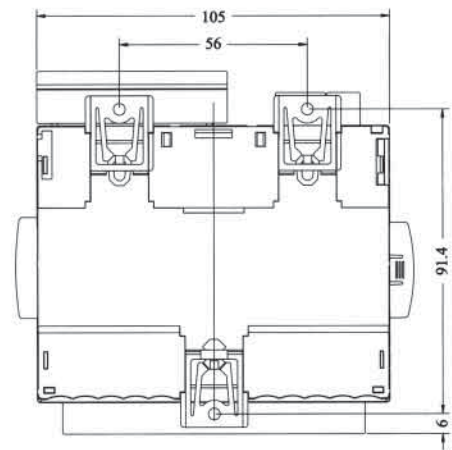
# DATA ACQUISITION MODULES

## 3. Dimension Unit: mm

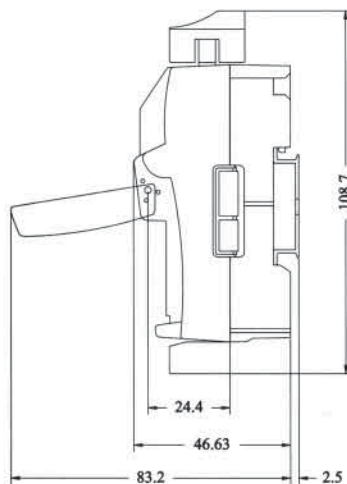
**FONT VIEW**



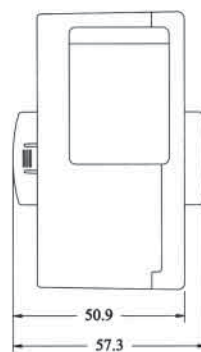
**REAR VIEW**



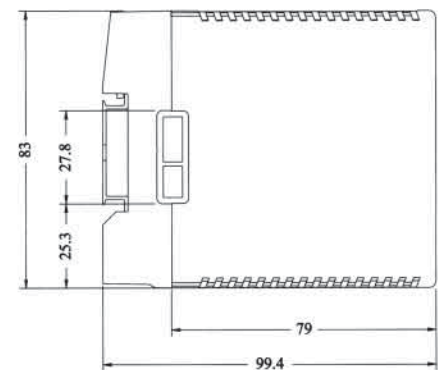
**SIDE VIEW**



**SOURCE FRONT VIEW**



**SOURCE SIDE VIEW**



**MULTI-CHANNEL MODULE ASSEMBLY**

**SOURCE MODULE**

