FineTek

Microprocessor Based Power Quality Meter

- Power Quality Meter
- Watt Hour/var Meter
- Power Factor Controller

V, A, PF, W, VAR, VA,

Wh, VARh, VA

V, A, PF, W, VAR, VA,

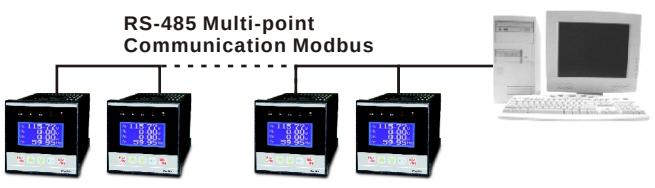
V, A, PF, W, VAR, VA,

http: //www.fine-tek.com

PF-3050 POWER QUALITY METER

The PF Power Quality Meter utilizes a 16 bit 61.44MHz DSP digital signal converter as it's main processor to produce timely and accurate results. Complemented with 3-phase electrical power A/D switching chip, it is able to sample 6 sets of signals simultaneously (3-phase voltage and 3-phase current) to produce accurate monitoring. Apart from the industry's standard of using switching mode single module A/D converter which produces a time lag in-between sampling, the PF provides digital analysis, display, regulation, output and other functions.

The PF, apart from displaying all electrical power units (V, A, PF, W, VAR, VA, Wh, VARh, VAh, Hz),harmonic analysis, the meter measures total harmonic distortion, odd harmonic distortion, and individual harmonic distortions for harmonics 3 through 21. it includes 2 relay outputs, availability to set max or min value for Voltage(V)/ Current(A)/ Active Power(W)/ Power Factor(PF). It also produces two pulse output for energy and reactive power (pulse/ kwh) readings. For communications interface, PF utilizes RS485 industrial standard (Modbus) to produce other output functions. The user will definitely find the PF user-friendly and easy to integrate into any systems

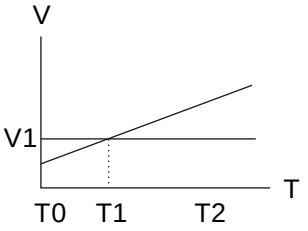


FEATURES

- Achieved Taiwan's CNLA Laboratory 0.2 grade electrical calibration as well as CE approval.
- Suitable for use in 3Æ3W / 3Æ4W power systems. Measured parameters: Voltage/Current/Power/Power Factor/Apparent/Reactive Power/Power Demand/ Frequency/Active Energy/Reactive Energy/ Apparent Energy.
- Utilizes 128x64 resolution blue LCD display for improved clarity.
- Able to connect to Voltage/Current transformers up to 1~10,000 ratio and automatically calculate the actual value.
- Provides RS485-Modbus communication interface.
- 2 sets of relay outputs able to set at Voltage/Current/Power/Power Factor/ Power Demand/requirements.
- 2 sets of transistor output used on active energy and reactive energy.
- Password protection on set parameters.
- Highest resolution of 0.2%
- Provides ModBus (ASCII and RTU) Communication interface.
- Precise True RMS measurements.

CONTACT OUTPUT

The PF-3050 includes 2 sets of relay outputs, each available to be used on Current, Voltage, Power, PF, PD value (Before PT, CT ratio conversion). The set points could be used as high (V, I, P, PD) or low (PF) value alarm, with relay-ON when alarm is triggered. The mode of action is as below:



T0~~T1: Relay OFF (V, I, P, PD)/Relay ON (PF)
T1~T2: Relay ON (V1I1, P1, PD)/Relay OFF (PF)

1. When V values are lower than V1 value, Relay is OFF.
2. When V values are higher than V1 value, Relay is ON.

TRANSISTOR OUTPUT:

The PF-3050 include 2 sets of open collection transistor output, able to be set as alarms on power energy (KWh/KVARh) and provide pulse output when triggered (Before PT, CT ratio conversion). The output ratio is set at 10000 Pulse/ KWh and 10000 Pulse/KVARh.

PF-3050 POWER QUALITY METER SPECIFICATIONS

Three Phase Powermeters and Analyzers

Measured Functions:		**a Phase**	**b Phase**	**c Phase**	**Total**
True RMS Voltage (Line to Neutral)	Average RMS total & per phase	Va	Vb	Vc	Ve
True RMS Voltage (Line to Line)		Vab	Vbc	Vca	Vle
Direct Voltage Input : 20~400V_{l-n} and 35~700 V_{l-l}	Real time total & per phase, Voltage Unbalance				
Programmable Votage to PT Ratio : 1 ~10,000					
Range of Reading : 0~4,000KV_{l-n} , 0~7,000KV_{l-l}					
Accuracy : ±0.2 % FS (10 % to 120 % FS)					
3ϕ 3W(△/Y), 3ϕ 4W(Y), Input Wire Gauge max AWG14					
True RMS Current (Amps)	Average RMS total & per phase	Ia	Ib	Ic	Ie
Secondary Current Input: 6A	Real time total & per phase				
Programmable Votage to CT Ratio: 1 ~10,000	Current Unbalance				
Range of Reading : 0~60,000 A	Max at 10 Amp				
Accuracy : ±0.2 % FS (0.5 % to 120 % FS)	Input Wire Gauge max AWG14				
Neutral Current (Amps)	Average RMS current				In
Range of Reading : 0~60,000 A	Real Time				
Accuracy : ±0.2 % FS (2 % to 150 % FS)					
Frequency (Hz)	Average Total				Fr
Range of Reading: 45~65 Hz	Real time				
Accuracy : ±0.2 % FS					
Power Functions:					
Active Power (Watts)	Average total & per phase	Pa	Pb	Pc	Pt
Range of Reading : -9999.9 to 9999.9 MW	Real time total & per phase				
Accuracy : ±0.35 % FS (|PF| ≧0.5)					
Reactive Power (vars)	Average total & per phase	Qa	Qb	Qc	Qt
Range of Reading : -9999.9 to 9999.9 MVAR	Real time total & per phase				
Accuracy : ±0.35 % FS (|PF| ≧0.5)					
Apparent Power (VA)	Average total & per phase	Sa	Sb	Sc	St
Range of Reading : 0 to 9999.9 MVA	Real time total & per phase				
Accuracy : ±0.35 % FS (|PF| ≧0.5)					
Power Factory (PF)	Average total & per phase	PFa	PFb	PFc	PFt
Range of Reading: 0.0~1.000	Real time total & per phase				
Accuracy : ±0.35 % reading (|PF| ≧0.5)					

PF-3050 POWER QUALITY METER SPECIFICATIONS

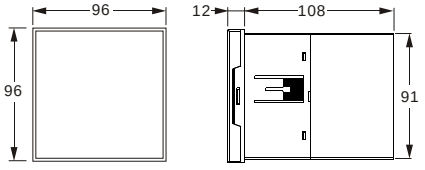
Three Phase Powermeters and Analyzers

Energy Functions:		**a Phase**	**b Phase**	**c Phase**	**Total**
+Active Energy (+PE)	Total & per phase(Import)	+PEa	+PEb	+PEc	+PEt
Range of Reading : 0 to 99,999 MWh	Total Net				
Accuracy : ±0.35 % reading (|PF| ≧0.5)					
-Active Energy (-PE)	Total & per phase(Export)	-PEa	-PEb	-PEc	-PEt
Range of Reading : 0 to 99,999 MWh	Total Net				
Accuracy : ±0.35 % reading (|PF| ≧0.5)					
+Reactive Energy (+QE)	Total & per phase(Import)	+QEa	+QEb	+QEc	+QEt
Range of Reading : 0 to 99,999 MVARh	Total Net				
Accuracy : ±0.35 % reading (|PF| ≧0.5)					
-Reactive Energy (-QE)	Total & per phase (Export)	-QEa	-QEb	-QEc	-QEt
Range of Reading : 0 to 99,999 MVARh	Total Net				
Accuracy : ±0.35 % reading (|PF| ≧0.5)					
Apparent Energy (SE)	Total & per phase(Import & Export)	SEa	SEb	SEc	SEt
Range of Reading : 0 to 99,999 MVARh	Total Net				
Accuracy : ±0.35 % reading (|PF| ≧0.5)					
Demand Functions:					
Active Power Demand (Watts) (same as active power)	Demand				PD
Demand Time 1~60 minute Adjustable.					
Accuracy : ±0.35 % reading (|PF| ≧0.5)	Max Demand				
Power Quality Harmonics					
Voltage Harmonic Magnitude/Phase Componenta(V/deg)	1~21' Average per phase	H-Va	H-Vb	H-Vc	
Current Harmonic Magnitude/Phase Componenta(A/deg)	1~21' Average per phase	H-Ia	H-Ib	H-Ic	
Total Voltage Harmonic Distortion THD (V) %	Average THD (V)% per phase	THD-Va	THD-Vb	THD-Vc	
Total Current Harmonic Distortion THD (I) %	Average THD (I)% per phase	THD-Ia	THD-Ib	THD-Ic	

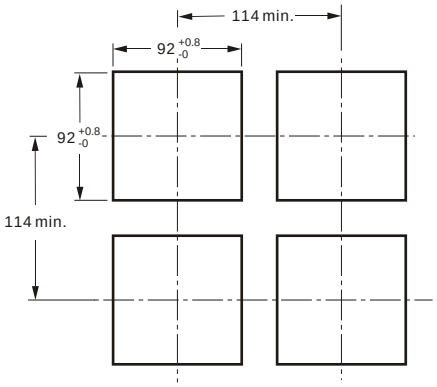
SPECIFICATIONS

Size (mm)	96 (W) x96 (H) x120 (D) DIN 1/4
Model	**PF**
Power Supply	85~265Vac ±10%, 45/65Hz
Display	128 X 64 Graphic LCM
Input Signal	3Æ3W / 3Æ4W V_{l-n}: 20~400Vac V_{l-l}: 35~700Vac I: 0.03~6A
Relay Output	SPST-ON x2, 3A/250Vac, 5A/30Vdc
Pulse Output	2 sets Open Collector Output (8~30Vdc,50mA) 1: 10,000pulse/KWh 2: 10,000pulse/KVARh
Communication Interface	RS485 ModBus
Operating Conditions	0~60°C(45~85% RH), Accuracy: 23±5°C
Storage Conditions	-10~70°C
Functions	3Æ3W / 3Æ4W Hz, V, I, P, Q, S, PF, PE, QE, SE, PD THD Harmonic 1~21'
Power/ Energy Range **(User able to connect CT and PT to expand range)**	Active Power: 0~7.5 KW Reactive Power: 0~7.5 KVAR Apparent Power: 0~7.5 KVA Active Energy: 0~400 MWh Reactive Energy: 0~400 MVARh Apparent Energy: 0~400 MVAh

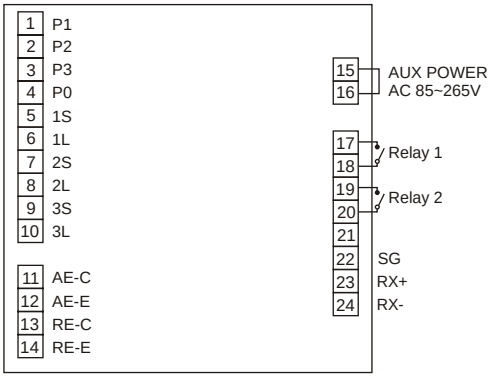
EXTERIOR



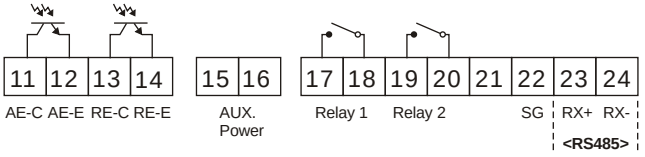
CUTOUT DIMENSIONS



TERMINAL ARRANGEMENTS:



TYPICAL WIRING:



AE: Active Energy Pulse Output
RE: Reactive Energy Pulse Output

ORDERING INFORMATION:

PF-3050-S□ □ □

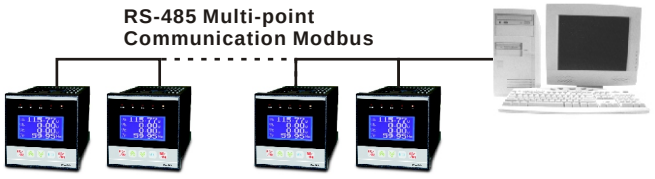
Relay	0---None 1---Relay output
Pulse Output	0---None 1---with pulse output
Communication Interface	0---None 1---RS485

PF-3150 POWER QUALITY METER

PF-3150 Power Quality Meter uses a 3Æ power measurement chip as it's core processor, it is able to measure all power units (V, I, F, P, Q, S, PF, QE, SE). The PF-3150 is equipped with 2 relay contact output which could be set to action upon user-determined values of voltage (V), current (I), Power (W), Power factor (PF) and Power Demand. Also available are 2 sets of transistor output with pulse/KWh and pulse/ KVARh output function.

PF-3150 uses the popular MODBUS (ASCII & RTU) communication interface for its communication platform. The RS-485 connection could be arranged in parallel sequence.

PF-3150 provides many output functions that will enable the user to successfully integrate into any system.

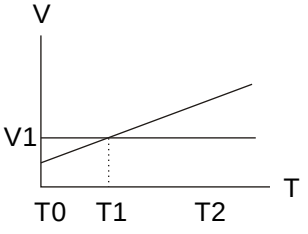


FEATURES

- Achieved Taiwan's CNLA Laboratory 0.5 grade electrical calibration as well as CE approval.
- Suitable for use in 3Æ3W / 3Æ4W power systems. Measured parameters: Voltage/Current/Power/Power Factor/Apparent/Reactive Power/Power Demand/ Frequency/Active Energy/Reactive Energy/ Apparent Energy.
- Utilizes 128x64 resolution blue LCD display for improved clarity.
- Able to connect to Voltage/Current transformers up to 1~10,000 ratio and automatically calculate the actual value.
- Provides RS485-Modbus communication interface.
- 2 sets of relay outputs able to set at Voltage/Current/Power/Power Factor/ Power Demand/requirements.
- 2 sets of transistor output used on active energy and reactive energy.
- Password protection on set parameters.
- Highest resolution of 0.2%
- Provides ModBus (ASCII and RTU) Communication interface.
- Precise True RMS measurements.

CONTACT OUTPUT

The PF-3150 includes 2 sets of relay outputs, each available to be used on Current, Voltage, Power, PF, PD value (Before PT, CT ratio conversion). The set points could be used as high (V, I, P, PD) or low (PF) value alarm, with relay-ON when alarm is triggered. The mode of action is as below:



T0~~T1: Relay OFF (V, I, P, PD)/Relay ON (PF)
T1~T2: Relay ON (V1I1, P1, PD)/Relay OFF (PF)

1. When V values are lower than V1 value, Relay is OFF.
2. When V values are higher than V1 value, Relay is ON.

TRANSISTOR OUTPUT:

The PF-3150 include 2 sets of open collection transistor output, able to be set as alarms on power energy (KWh/KVARh) and provide pulse output when triggered (Before PT, CT ratio conversion). The output ratio is set at 1 Pulse/ Wh and 1Pulse/VARh.

PF-3150 POWER QUALITY METER SPECIFICATIONS

Three Phase Powermeters and Analyzers

Measured Functions:		**a Phase**	**b Phase**	**c Phase**	**Total**
True RMS Voltage (Line to Neutral)	Average RMS total & per phase	Va	Vb	Vc	Ve
True RMS Voltage (Line to Line)		Vab	Vbc	Vca	Vle
Direct Voltage Input : 20~400V_{l-n} and 35~700 V_{l-l}	Real time total & per phase, Voltage Unbalance				
Programmable Votage to PT Ratio : 1 ~10,000					
Range of Reading : 0~4,000KV_{l-n} , 0~7,000KV_{l-l}					
Accuracy : ±0.5 % FS (10 % to 120 % FS)					
3ϕ 3W(△/Y), 3ϕ 4W(Y), Input Wire Gauge max AWG14					
True RMS Current (Amps)	Average RMS total & per phase	Ia	Ib	Ic	Ie
Secondary Current Input: 0.025~5A	Real time total & per phase				
Programmable Votage to CT Ratio: 1 ~50,000	Current Unbalance				
Range of Reading : 0-- 60,000 A	Max at 10 Amp				
Accuracy : ±0.5 % FS (0.5 % to 120 % FS)	Input Wire Gauge max AWG14				
Frequency (Hz)	Average Total	Fa	Fb	Fc	Fe
Range of Reading: 45~65 Hz	Real time				
Accuracy : ±0.5 % FS					
Power Functions:					
Active Power (Watts)	Average total & per phase	Pa	Pb	Pc	Pt
Range of Reading : -9999.9 to 9999.9 MW	Real time total & per phase				
Accuracy : ±0.5 % FS (|PF| ≧0.5)					
Reactive Power (vars)	Average total & per phase	Qa	Qb	Qc	Qt
Range of Reading : -9999.9 to 9999.9 MVAR	Real time total & per phase				
Accuracy : ±0.5 % FS (|PF| ≧0.5)					
Apparent Power (VA)	Average total & per phase	Sa	Sb	Sc	St
Range of Reading : 0 to 9999.9 MVA	Real time total & per phase				
Accuracy : ±0.5 % FS (|PF| ≧0.5)					
Power Factory (PF)	Average total & per phase	PFa	PFb	PFc	PFt
Range of Reading: 0.0 -- 1.000	Real time total & per phase				
Accuracy : ±0.5 % reading (|PF| ≧0.5)					

PF-3150 POWER QUALITY METER SPECIFICATIONS

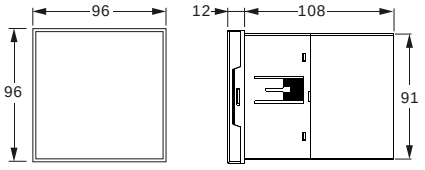
Three Phase Powermeters and Analyzers

Energy Functions:		**a Phase**	**b Phase**	**c Phase**	**Total**
+Active Energy (+PE)	Total & per phase(Import)	+PEa	+PEb	+PEc	+PEt
Range of Reading : 0 to 99,999 MWh	Total Net				
Accuracy : ±0.5 % reading (|PF| ≧0.5)					
-Active Energy (-PE)	Total & per phase(Export)	-PEa	-PEb	-PEc	-PEt
Range of Reading : 0 to 99,999 MWh	Total Net				
Accuracy : ±0.5 % reading (|PF| ≧0.5)					
+Reactive Energy (+QE)	Total & per phase(Import)	+QEa	+QEb	+QEc	+QEt
Range of Reading : 0 to 99,999 MVARh	Total Net				
Accuracy : ±0.5 % reading (|PF| ≧0.5)					
-Reactive Energy (-QE)	Total & per phase (Export)	-QEa	-QEb	-QEc	-QEt
Range of Reading : 0 to 99,999 MVARh	Total Net				
Accuracy : ±0.5 % reading (|PF| ≧0.5)					
Apparent Energy (SE)	Total & per phase(Import & Export)	SEa	SEb	SEc	SEt
Range of Reading : 0 to 99,999 MVARh	Total Net				
Accuracy : ±0.5 % reading (|PF| ≧0.5)					
Demand Functions:					
Active Power Demand (Watts) (same as active power)	Demand				PD
Demand Time 1~30 minute Adjustable.					
Accuracy : ±0.5 % reading (|PF| ≧0.5)	Max Demand				

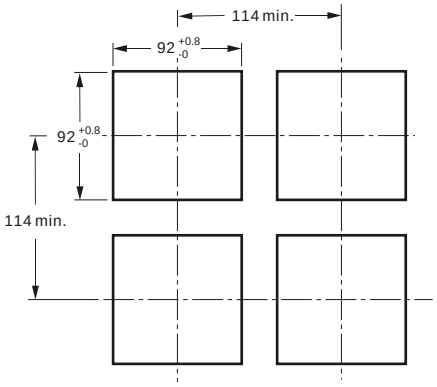
SPECIFICATIONS

Size (mm)	96 (W) x96 (H) x120 (D) DIN 1/4
Model	**PF**
Power Supply	85~265Vac ±10%, 45/65Hz
Display	128 X 64 Graphic LCM
Input Signal	3Æ3W / 3Æ4W V_{l-n}: 20~400Vac V_{l-l}: 35~700Vac I: 0.03~6A
Relay Output	SPST-ON x2, 3A/250Vac, 5A/30Vdc
Pulse Output	2 sets Open Collector Output (8~30Vdc,50mA) 1: 1pulse/Wh 2: 1pulse/VARh
Communication Interface	RS485 ModBus
Operating Conditions	0~60°C(45~85% RH), Accuracy: 23±5°C
Storage Conditions	-10~70°C
Functions	3Æ3W / 3Æ4W Hz, V, I, P, Q, S, PF, PE, QE, SE, PD
Power/ Energy Range **(User able to connect CT and PT to expand range)**	Active Power: 0~6000 W Reactive Power: 0~6000 VAR Apparent Power: 0~6000 VA Active Energy: 0~400 MWh Reactive Energy: 0~400 MVARh Apparent Energy: 0~400 MVAh

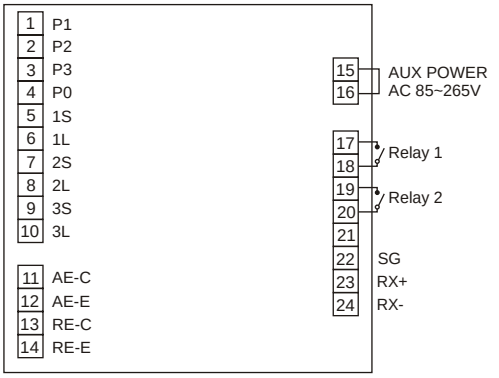
EXTERIOR



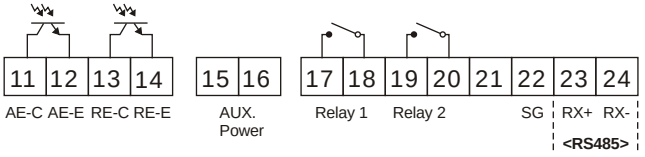
CUTOUT DIMENSIONS



TERMINAL ARRANGEMENTS:



TYPICAL WIRING:



AE: Active Energy Pulse Output
RE: Reactive Energy Pulse Output

ORDERING INFORMATION:

PF-3150-S□ □ □

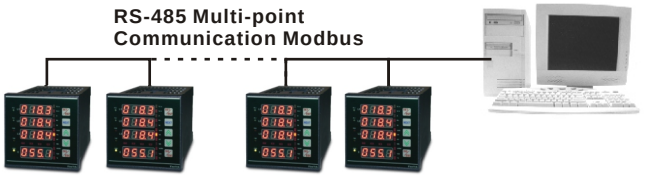
Relay	0---None 1---Relay output
Pulse Output	0---None 1---with pulse output
Communication Interface	0---None 1---RS485

PF-3350 POWER QUALITY METER

PF-3350 Power Quality Meter uses a 3Æ power measurement chip as it's core processor, it is able to measure all power units (V, I, F, P, Q, S, PF, QE, SE). The PF-3350 is equipped with 2 relay contact output which could be set to action upon user-determined values of voltage (V), current (I), Power (W), Power factor (PF) and Power Demand. Also available are 2 sets of transistor output with pulse/KWh and pulse/ KVARh output function.

PF-3350 uses the popular MODBUS (ASCII & RTU) communication interface for its communication platform. The RS-485 connection could be arranged in parallel sequence.

PF-3350 provides many output functions that will enable the user to successfully integrate into any system.

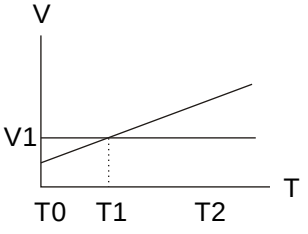


FEATURES

- Achieved Taiwan's CNLA Laboratory 0.5 grade electrical calibration as well as CE approval.
- Suitable for use in 3Æ3W / 3Æ4W power systems. Measured parameters: Voltage/Current/Power/Power Factor/Apparent/Reactive Power/Power Demand/ Frequency/Active Energy/Reactive Energy/ Apparent Energy.
- Utilizes 4 rows of four digit seven segment LED display.
- Able to connect to Voltage/Current transformers up to 1~9,999 ratio and automatically calculate the actual value.
- Provides RS485-Modbus communication interface.
- 2 sets of relay outputs able to set at Voltage/Current/Power/Power Factor/ Power Demand/requirements.
- 2 sets of transistor output used on active energy and reactive energy.
- Password protection on set parameters.
- Highest resolution of 0.5%
- Provides ModBus (ASCII and RTU) Communication interface.
- Precise True RMS measurements.

CONTACT OUTPUT

The PF-3350 includes 2 sets of relay outputs, each available to be used on Current, Voltage, Power, PF, PD value (Before PT, CT ratio conversion). The set points could be used as high (V, I, P, PD) or low (PF) value alarm, with relay-ON when alarm is triggered. The mode of action is as below:



T0~~T1: Relay OFF (V, I, P, PD)/Relay ON (PF)
T1~T2: Relay ON (V1I1, P1, PD)/Relay OFF (PF)

1. When V values are lower than V1 value, Relay is OFF.
2. When V values are higher than V1 value, Relay is ON.

TRANSISTOR OUTPUT:

The PF-3350 include 2 sets of open collection transistor output, able to be set as alarms on power energy (KWh/KVARh) and provide pulse output when triggered (Before PT, CT ratio conversion). The output ratio is set at 1Pulse/ Wh and 1Pulse/VARh.

PF-3350 POWER QUALITY METER SPECIFICATIONS

Three Phase Powermeters and Analyzers

Measured Functions:		**a Phase**	**b Phase**	**c Phase**	**Total**
True RMS Voltage (Line to Neutral)	Average RMS total & per phase	Va	Vb	Vc	Ve
True RMS Voltage (Line to Line)		Vab	Vbc	Vca	Vle
Direct Voltage Input : 20~400V_{l-n} and 35~700 V_{l-l}	Real time total & per phase, Voltage Unbalance				
Programmable Votage to PT Ratio : 1 ~9,999					
Range of Reading : 0~3,999.6KV_{l-n} , 0~6,999.3KV_{l-l}					
Accuracy : ±0.5 % FS (10 % to 120 % FS)					
3ϕ 3W(△/Y), 3ϕ 4W(Y), Input Wire Gauge max AWG14					
True RMS Current (Amps)	Average RMS total & per phase	Ia	Ib	Ic	Ie
Secondary Current Input: 0.025~5A	Real time total & per phase				
Programmable Votage to CT Ratio: 1 ~9,999	Current Unbalance				
Range of Reading : 0-- 49,995 A	Max at 10 Amp				
Accuracy : ±0.5 % FS (0.5 % to 120 % FS)	Input Wire Gauge max AWG14				
Frequency (Hz)	Average Total	Fa	Fb	Fc	Fe
Range of Reading: 45~65 Hz	Real time				
Accuracy : ±0.5 % FS					
Power Functions:					
Active Power (Watts)	Average total & per phase	Pa	Pb	Pc	Pt
Range of Reading : -9999.9 to 9999.9 MW	Real time total & per phase				
Accuracy : ±0.5 % FS (|PF| ≧0.5)					
Reactive Power (vars)	Average total & per phase	Qa	Qb	Qc	Qt
Range of Reading : -9999.9 to 9999.9 MVAR	Real time total & per phase				
Accuracy : ±0.5 % FS (|PF| ≧0.5)					
Apparent Power (VA)	Average total & per phase	Sa	Sb	Sc	St
Range of Reading : 0 to 9999.9 MVA	Real time total & per phase				
Accuracy : ±0.5 % FS (|PF| ≧0.5)					
Power Factory (PF)	Average total & per phase	PFa	PFb	PFc	PFt
Range of Reading: 0.0 -- 1.000	Real time total & per phase				
Accuracy : ±0.5 % reading (|PF| ≧0.5)					

PF-3350 POWER QUALITY METER SPECIFICATIONS

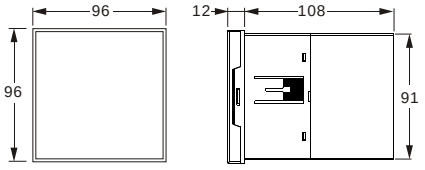
Three Phase Powermeters and Analyzers

Energy Functions:		**a Phase**	**b Phase**	**c Phase**	**Total**
+Active Energy (+PE)	Total & per phase(Import)	+PEa	+PEb	+PEc	+PEt
Range of Reading : 0 to 99,999 MWh	Total Net				
Accuracy : ±0.5 % reading (|PF| ≧0.5)					
-Active Energy (-PE)	Total & per phase(Export)	-PEa	-PEb	-PEc	-PEt
Range of Reading : 0 to 99,999 MWh	Total Net				
Accuracy : ±0.5 % reading (|PF| ≧0.5)					
+Reactive Energy (+QE)	Total & per phase(Import)	+QEa	+QEb	+QEc	+QEt
Range of Reading : 0 to 99,999 MVARh	Total Net				
Accuracy : ±0.5 % reading (|PF| ≧0.5)					
-Reactive Energy (-QE)	Total & per phase (Export)	-QEa	-QEb	-QEc	-QEt
Range of Reading : 0 to 99,999 MVARh	Total Net				
Accuracy : ±0.5 % reading (|PF| ≧0.5)					
Apparent Energy (SE)	Total & per phase(Import & Export)	SEa	SEb	SEc	SEt
Range of Reading : 0 to 99,999 MVARh	Total Net				
Accuracy : ±0.5 % reading (|PF| ≧0.5)					
Demand Functions:					
Active Power Demand (Watts) (same as active power)	Demand				PD
Demand Time 1~30 minute Adjustable.					
Accuracy : ±0.5 % reading (|PF| ≧0.5)	Max Demand				

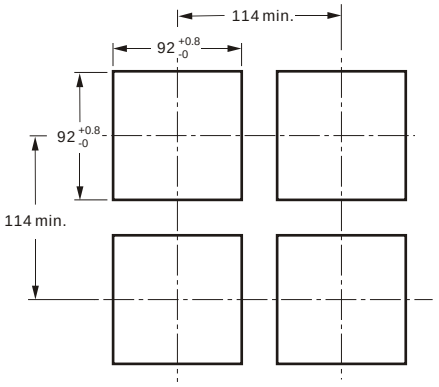
TYPICAL WIRING

SPECIFICATIONS	
Size (mm)	96 (W) x96 (H) x120 (D) DIN 1/4
Model	**PF**
Power Supply	85~265Vac ±10%, 45/65Hz
Display	LED
Input Signal	3Æ3W / 3Æ4W V_{l-n}: 20~400Vac V_{l-l}: 35~700Vac I: 0.03~6A
Relay Output	SPST-ON x2, 3A/250Vac, 5A/30Vdc
Pulse Output	2 sets Open Collector Output (8~30Vdc,50mA) 1: 1pulse/Wh 2: 1pulse/VARh
Communication Interface	RS485 ModBus
Operating Conditions	0~60°C(45~85% RH), Accuracy: 23±5°C
Storage Conditions	-10~70°C
Functions	3Æ3W / 3Æ4W Hz, V, I, P, Q, S, PF, PE, QE, SE, PD
Power/ Energy Range **(User able to connect CT and PT to expand range)**	Active Power: 0~6000 W Reactive Power: 0~6000 VAR Apparent Power: 0~6000 VA Active Energy: 0~400 MWh Reactive Energy: 0~400 MVARh Apparent Energy: 0~400 MVAh

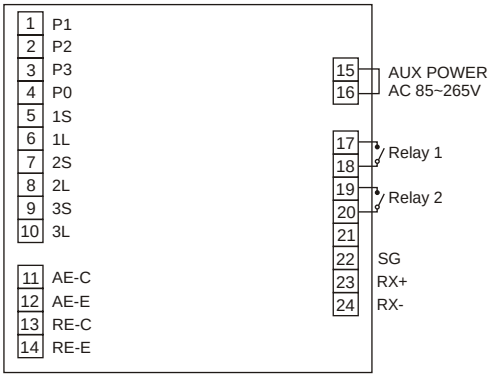
EXTERIOR



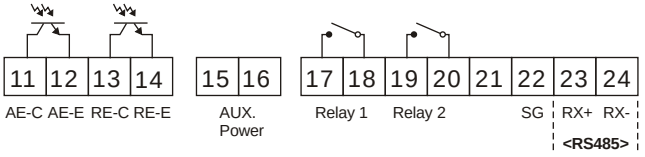
CUTOUT DIMENSIONS



TERMINAL ARRANGEMENTS:



TYPICAL WIRING:



AE: Active Energy Pulse Output
RE: Reactive Energy Pulse Output

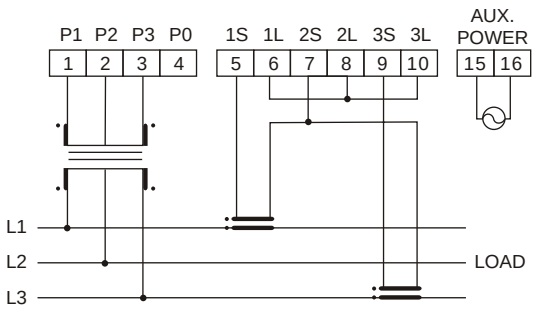
ORDERING INFORMATION:

PF-3350-S□ □ □

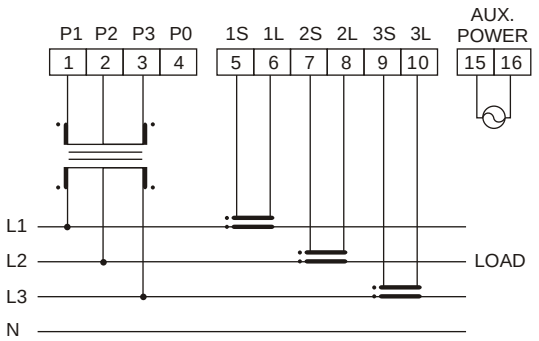
Relay	0---None 1---Relay output
Pulse Output	0---None 1---with pulse output
Communication Interface	0---None 1---RS485

PF-3050/3150/3350 TYPICAL WIRING

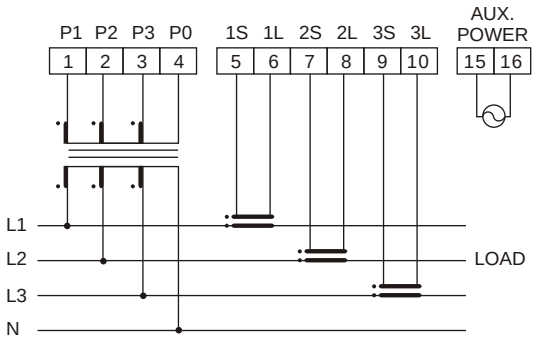
A. 3 Phase 3-Wire with 2PTs, 2CTs



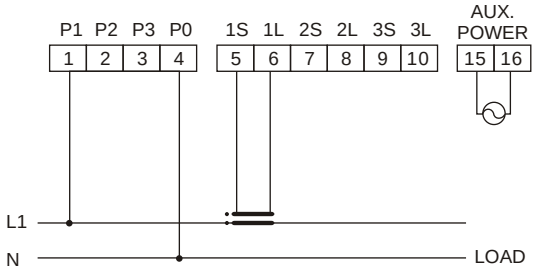
B. 3 Phase 3-Wire with 3PTs, 3CTs



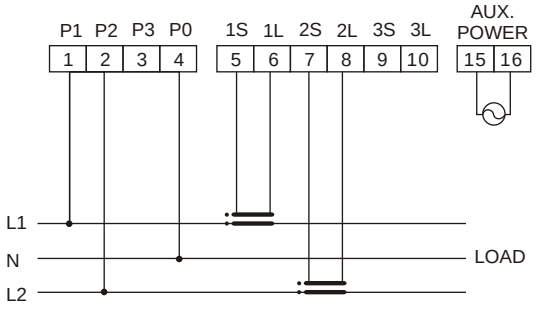
C. 3 Phase 4-Wire with 3PTs, 3CTs



D. 1 Phase 2-Wire with 1CTs (no PTs)



E. 1 Phase 3-Wire with 2CTs (no PTs)



PF-5□30 WATT HOUR/VAR METER

Watt Hour Meter was a 3Æ power measurement chip as it's core processor, it is able to measure active power and active energy (P, PE) or reactive power and reactive energy (Q, QE). The meter provides a transistor pulse output for active energy/reactive energy (pulse/Kwh) function.

PF-5□30 uses the popular MODBUS (ASCII & RTU) communication interface for its communication platform, its ease of use and various functions allows the user quick and easy integrate of the system.

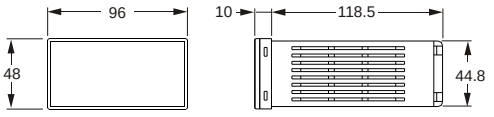
SPECIFICATIONS

Size (mm)	96 (W) x48 (H) x120 (D) DIN 1/4
Model	**PF-5□30**
Power Supply	85~265Vac, 50~60Hz ± 10%
Display	Dual Display for WATT & WATT-HR / VAR & VAR-HR WATT: 0～99999 WATT-HR: 0～999999
Input	1.Direct Input Max: Voltage: 50～500 V, VAR:0~99999 Current: 0.025～5 A, VAR-HR:0~999999 WATT: 7500 W / VAR: 7500Var 2.PT/CT Range: PT: 50～60000 $V_{primary}$ / 50～500 $V_{secondary}$ CT: 1～60000 $A_{primary}$ / 1～5 $A_{secondary}$
Relay Output	SPST-ON x2, 3A/250Vac, 5A/30Vdc
Pulse Output	1. Open collect: 8-30V / 50mA(MAX) 2. Settable Rang: 0.001~1000 Pulse / 1Count (KWH)/(KVARH)
Communication Interface	RS485 ModBus
Memory	By EEPROM
Operating Conditions	0~60°C，20%~90% RH non-condensed
Storage Conditions	0~70°C，20%~90% RH non-condensed
Functions	WATT & WATT-HR / VAR & VAR-HR 1f 2W、1f 3W、3f 3W、3f 4W
Accuracy	±1% Full Scale ±1 Count

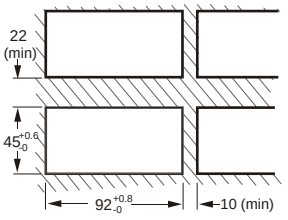
FEATURES:

- Suitable for use in 1Æ2W /1Æ3W /3Æ3W /3Æ4W apower systems. Measured parameters: active power, active energy, reactive power and reactive energy.
- Uses dual display for active power, active energy, reactive power and reactive energy indication:
  Active Power/Reactive Power: 0.31" Five Digit Seven Segment Display
  Active energy/Reactive Energy: 0.56" Six Digit Seven Segment Display.
- Able to connect to voltage transformer/ current transformer (PT/CT), so as to increase measurement range. Automatic calculation of actual values:
  PT-50~60000 $V_{primary}$/50~500$V_{secondary}$
  CT: 1~60000 $A_{primary}$/1~5 $A_{secondary}$
- Provide 1 set of transistor output. Output dependent upon active energy reactive energy to produce voltage pulse.
- Provides RS-485 Modbus (RTU) communication interface.

EXTERIOR:



CUTOUT DIMENSIONS:



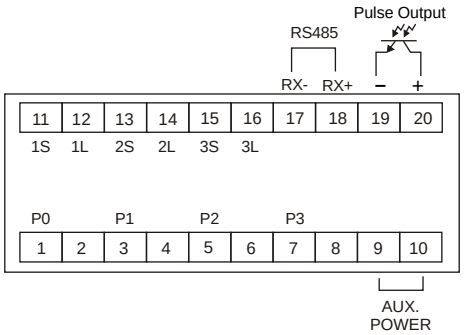
ORDERING INFORMATION:

P F - 5 □ 3 0 - S □ □ □

量測 功能	0---Watt Hour 1---VAR Meter
Power Supply	S---85~265Vac
量測 規格	0---1Æ2W 2---3Æ3W 1---1Æ3W 3---3Æ4W
Pulse Output	0---None 1---with pulse output
Communication Interface	0---None 1---RS485

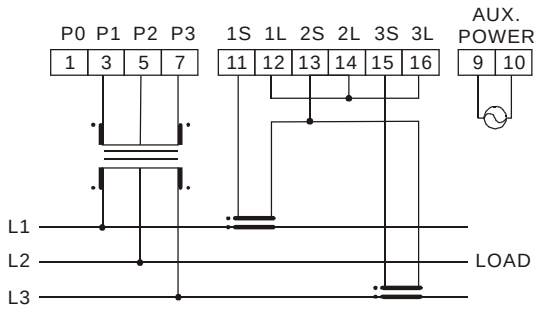
PF-5□30 TERMINAL ARRANGEMENTS/TYPICAL WIRING

TERMINAL ARRANGEMENTS:

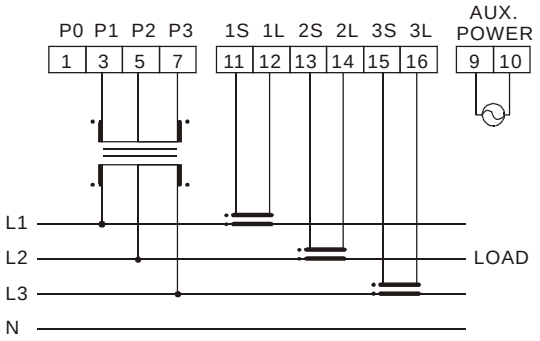


TYPICAL WIRING:

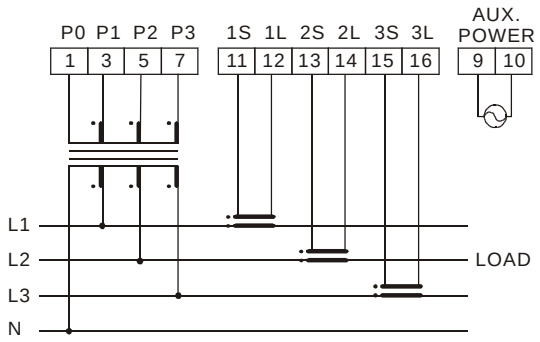
A. 3 Phase 3-Wire with 2PTs, 2CTs



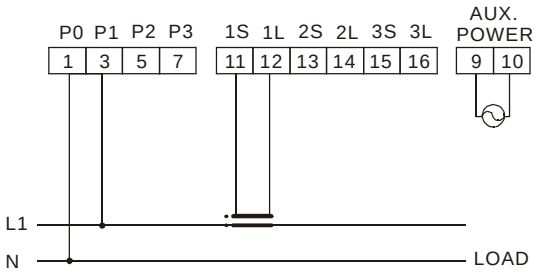
B. 3 Phase 3-Wire with 3PTs, 3CTs



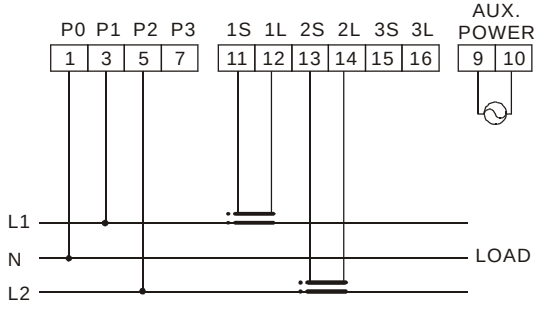
C. 3 Phase 4-Wire with 3PTs, 3CTs



D. 1 Phase 2-Wire with 1CTs (no PTs)



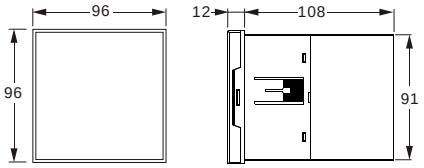
E. 1 Phase 3-Wire with 2CTs (no PTs)



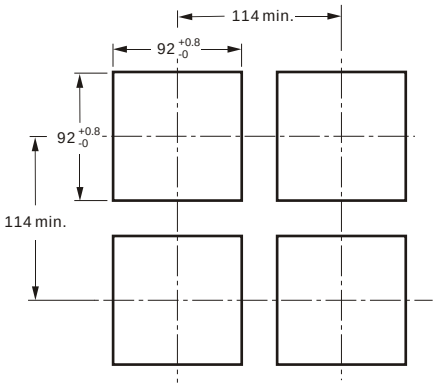
PR-□□50 POWER FACTOR CONTROLLER

The PR Power Factor Controller uses a 3ÆPower measurement clips as its core processor. It can measure the power factor (PF), and provide either 6 or 12 relay outputs on a modular model. The relay output method could be selected from 4 capacitance ratio and 5 operation modes, thereby improving the power factor through effective use of the relay outputs. The PR uses the popular MODBUS (RTU) communications interface for its communication platform and could be arranged in parallel sequence. The PR is user friendly and makes system integration very simple.

EXTERIOR



CUTOUT DIMENSIONS



FEATURES

- Provides Manual/Auto option for relay action modes.
- Uses 0.56" four digit seven segment display indication.
- Modular design for 6 or 12 (Expendable) relay output function.
- Total of 4 types of capacitance ratio connection and 5 types of operation modes for relay action selection.
- Provides RS-485 Modbus (RTU) communications interface.
- Automatically switch relay action modes, averaging out capacitances operating time and enhance capacitor operation life time.

SPECIFICATIONS

Size (mm)	96 (W) x96 (H) x120 (D) DIN 1/4
Model	**PR**
Power Supply	220~380Vac,50~60Hz
Input	Voltage (V_{L-L})：20～500 V Current：0.025～5 A
Output	Relay Output： 接點容量：3A / 250V
Control Modes	Pro0：Uncondentional cyclic control Capacitance ratio: 1:1:1:1:1:1:...:1:1 Pro1：Cyclic/optimum control Capacitance ratio: 1:1:1:1:1:1:...:1:1 Pro2：Multistep control Capacitance ratio: 1:2:2:2:2:2:...:2:2 Pro3：Multistep control Capacitance ratio: Pro3：1:2:4:4:4:4:...:4:4 Pro4：Multistep control Capacitance ratio: Pro4：1:2:4:8:8:8:...:8:8
Communication Interface	RS485 ModBus
Memory	By EEPROM
Operating Conditions	0~60℃，20%~90% RH non-condensed
Storage Conditions	0~70℃，20%~90% RH non-condensed
Measurement	Power Factor (PF)： Range：IND. 0.001~1.000~CAP. 0.001
Accuracy	±1% Full Scale ±1 Count

ORDERING INFORMATION:

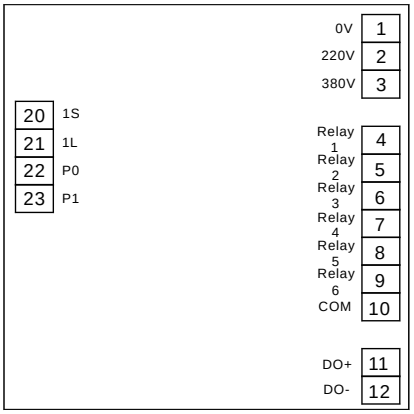
P R - □ □ 5 0 - □ □

量測規格	06---6 Step Relay 12---12 Step Relay
Power Supply	D---220/380Vac
Communication Interface	0---None 1---RS485

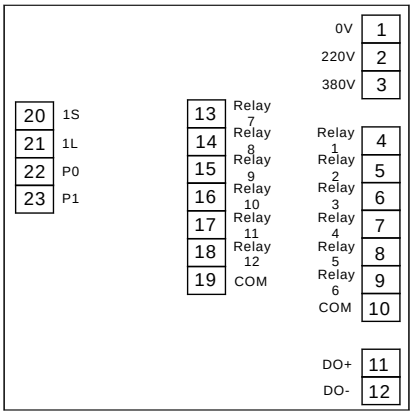
PR-□□50 TERMINAL ARRANGEMENTS/TYPICAL WIRING

TERMINAL ARRANGEMENTS:

PR-1250-SX

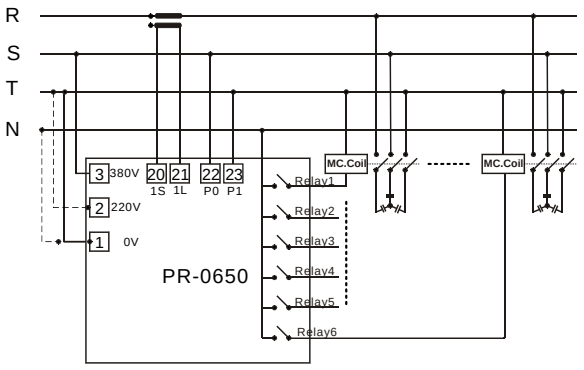


PR-0650-SX



TYPICAL WIRING:

PR-0650-SX



PR-1250-SX