

# Power Measurement Unit

**PM 2214**

## Application and features

- ⊙ Power supervision / SCADA system
- ⊙ Feeder automation / customized
- ⊙ 0.05% high accuracy
- ⊙ Cost saving for 4 feeder transducers
- ⊙ Power quality analysis IEC 61000-4-30
- ⊙ Speedy real data conversion rate up to 1 cycle



## Specification

### 1. Unit configuration

#### 1-1 Processing and interface

CPU	32 bits
Comports	Main : RS-485 / option : LAN – RJ45 Diagnostic : RS-232
Protocol	Modbus RTU

#### 1-2 Inputs

Voltages / main bus	Software setup	Detection ( * vector composed)
	3U – 3 phase 4 wires	Va, Vb, Vc, *V0 ; *Vab, *Vbc, *Vca
Currents / 4 feeders	3U – 3 phase 3 wires	*Va, *Vb, *Vc ; Vab, Vbc, *Vca
	3I / Ia, Ib, Ic	Ia, Ib, Ic, *I0
Input setup and wiring	2I / Ia, Ic	Ia, *Ib, Ic
	3P4W 3CT / 3U12I	
	3P3W 3CT / 3U12I 3P3W 2CT / 3U8I	
Conversion	3 elements	P, Q (P1, P2, P3, Q1, Q2, Q3)
	ADC 16 bits with 8 synchronized channels	
	Rate of real data conversion, 1-32 cycle adjustable	

#### 1-3 Power quality analysis (option)

IEC 61000-4-30  
 Harmonic analysis  
 Voltage dips  
 Voltage unbalance (negative and zero sequence)  
 Voltage flicker  $\Delta V_{10}$   
 Voltage low frequency spectrum (0.5-5Hz)

#### 1-4 Waveform recording (option)

Ring buffer, length of 16 cycles total 1728 samples / three phase phasor  
 AC waveform 36 samples / cycle  
 Trend of speedy real rms datas 36 samples / cycle for VRMS, ARMS  
 5 three phase phasors maximum



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## 2. Input ranges

Voltages	Frequency : 45 – 65 Hz 10 – 300V phase to neutral Maximum over $\leq 1000V_{rms}$ , 2 seconds Input resistance $\geq 1M\Omega$
Currents	CT 5A ( 0 ~ 6A ) or CT 1A ( 0 ~ 1.2A ) Maximum over 3 x CT continuous : $\leq 25 \times CT$ , 2 seconds : $\leq 50 \times CT$ , 1 seconds Burden $\leq 0.1VA$ for 1 x CT input

## 3. Measured parameters

### 3-1 Normal parameters

	25±5 °C Stability $\leq 50PPM$ (-10~50°C) , $\leq 70PPM$ (-30~70°C)
System frequency (Hz)	⊙ 0.05% of nominal frequency
Voltage (RMS)	⊙ 0.05% of nominal voltage Voltages phase to neutral, phase and $\Sigma$ Voltages phase to phase, line and $\Sigma$
Current (RMS)	⊙ 0.2% of nominal voltage for $V_0$ ⊙ 0.05% of nominal CT, $I_a$ , $I_b$ , $I_c$ and $\Sigma$ ⊙ 0.2% of nominal CT for $I_0$
Active power (W)	⊙ 0.2% of (nominal voltage x CT), phase and $\Sigma$
Reactive power (Var)	⊙ 0.2% of (nominal voltage x CT), phase and $\Sigma$
Active energy (WH)	⊙ 0.2% of (Equate to Active Power), $\Sigma$ each Feeder
Reactive energy (VarH)	⊙ 0.2% of (Equate to Reactive Power) , $\Sigma$ each Feeder
Power factor (PF)	⊙ 0.2% (each phase and Feeder)
Phase angle	⊙ 0.5° for A-V (each phase)
Phase rotation	⊙ Auto-detection

### 3-2 Power quality parameters

Sequence (voltage)	⊙ 0.2% of nominal voltage Positive sequence Negative sequence Zero sequence
Voltage unbalance	⊙ 0.2% of positive sequence voltage Zero sequence unbalance (%) Negative sequence unbalance (%)
Distortion in harmonics	Analysis in $V_a$ , $V_b$ , $V_c$ , $I_a$ , $I_b$ , $I_c$ Analysis with fundamental and 2 <sup>th</sup> to 17 <sup>th</sup> Distortion, HD-F and THD-F
Voltage flicker	$\Delta V_{10}$ (%)
Spectrum of low frequency	0.5 – 1 – 2 – 3 – 4 – 5 Hz
Voltage dips	Pick up with time inversed curve



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## 4. Electrical characteristics

Dielectric strength	◎ IEC 255-5, 2KV ACRMS 1 minute
Impulse and surge	◎ IEC 61000-4-2, class III IEC 61000-4-3, class III IEC 61000-4-4, class III IEC 61000-4-5, class III IEC 61000-4-12, class III
Safety	◎ IEC 60068-2 standard for burn-in test : operating Temperature cycling test -40 to 85°C (start at -40 to 85°C, 2 cycle 8 hours), RH 10 to 95% non-condensed High temperature test 85°C RH 55% 16 hours Temperature / humidity cycling test 40°C RH 95% 16 hours ◎ IEC 60068-2-6 : Vibration endurance 2G 9-350Hz 1 hour ◎ IEC 60068-2-27 : Mechanical shock test 15G 11ms 24 hours
Power supply	LO : DC 20~60V HI : AC 80~260V @ 40~70 Hz, DC 80~330V Dissipation maximum 10 VA for AC and 5W for DC



## 5. Model & Ordering

Model : PM 2214

Ordering :

PM2214\_3U12I - A - 1 - 1 - LO - 1 - B

**Version**

**Voltage Input**

1 : 10-300V

**Current Input**

1 : 0-1A

2 : 0-5A

**Power**

HI : AC 80-260V, DC 80-330V

LO : DC 20-60V

**Option**

N : None

A : Power Quality Analysis

B : Waveform Recode

**Communication Port**

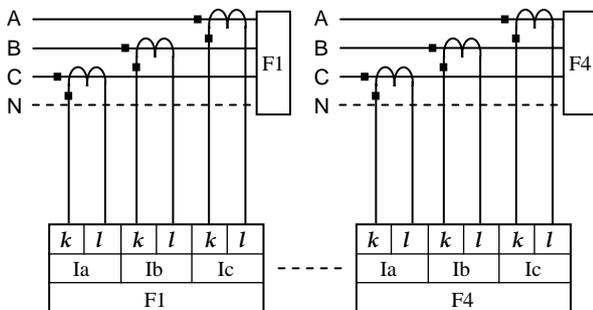
1 : RS-485 + RS-232

2 : RS-485 + RS-232 + RJ-45

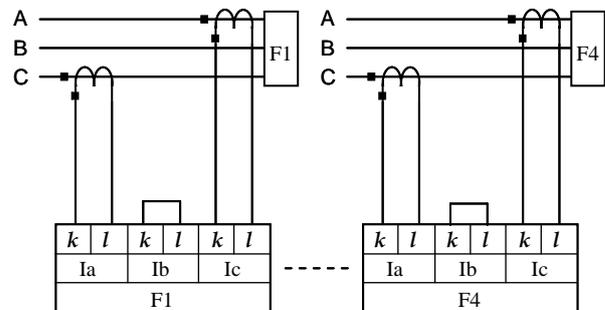
Y : Special ordering

## 6. Wiring

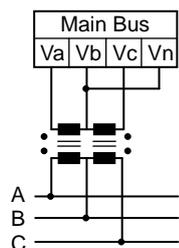
3 Current (Ia, Ib, Ic) for 3P4W, 3P3W



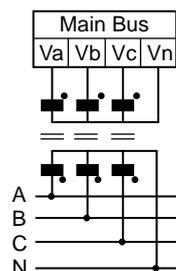
2 Current (Ia, Ic) for 3P3W



3 phase 3 wires 3U input



3 phase 4 wires 3U input



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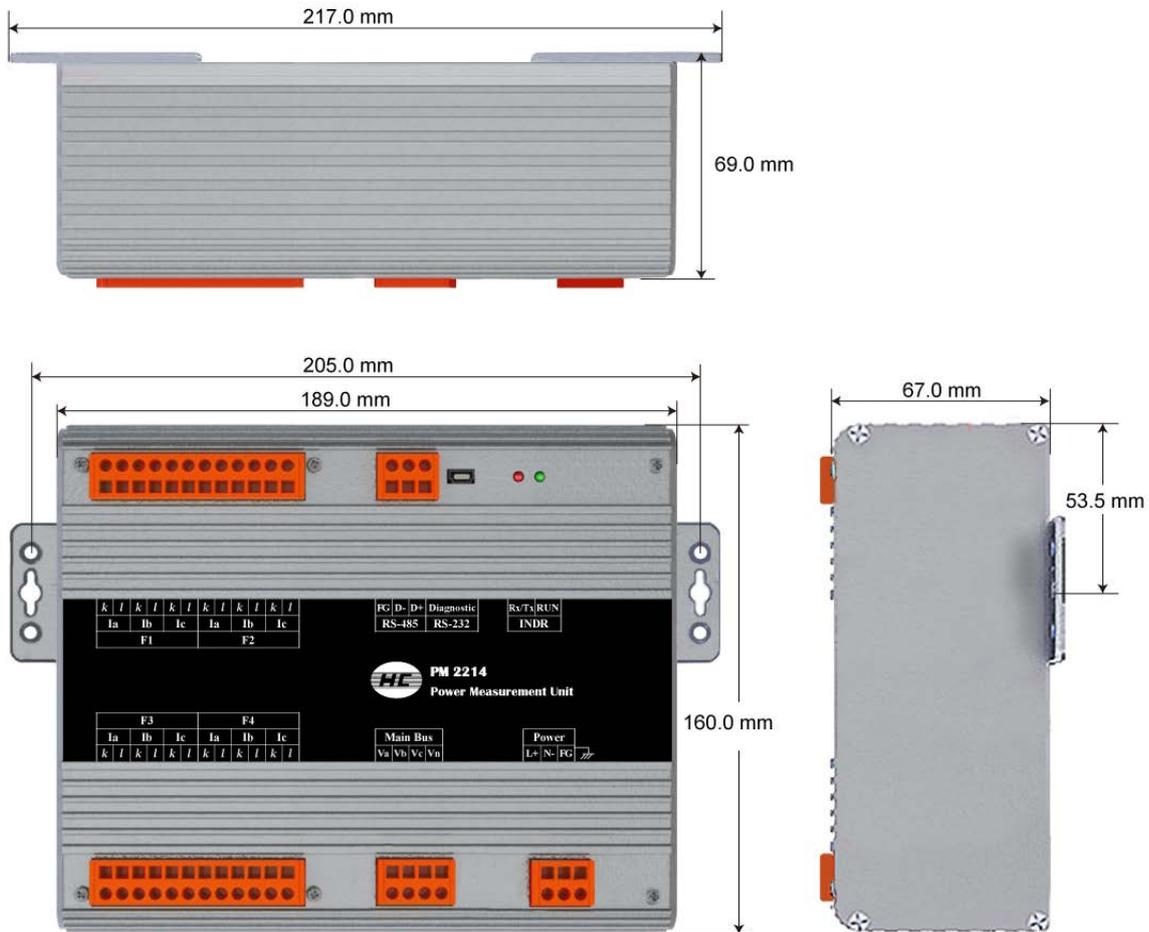
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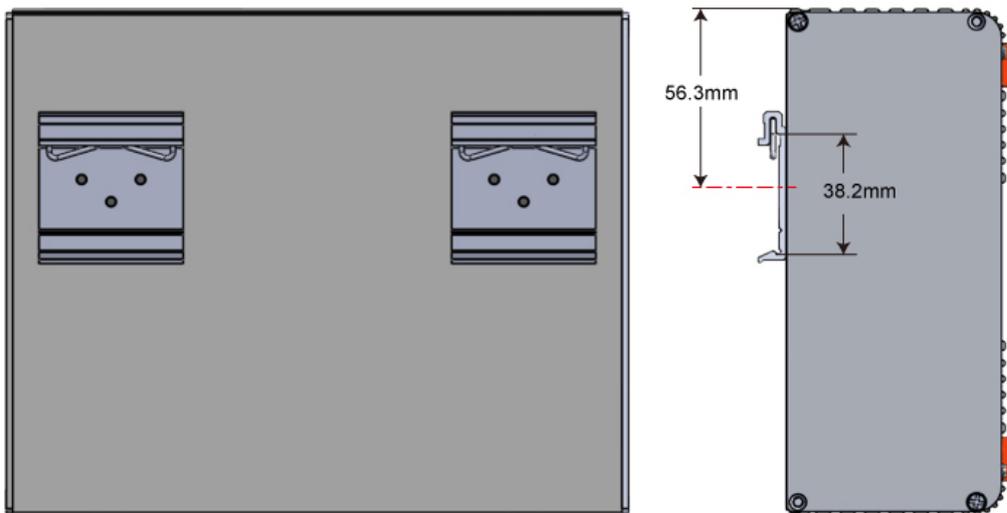
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## 7. Dimension/Mount



### Din Rail Mount (with 35 mm)



## 8. Wight = 1100g ± 50g



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