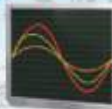


# Acuvim II Series High Performance Meters



Waveform  
Capture



Real Time  
Metering



Email



Data Logging



TOU

**Max &  
Min**

Max & Min  
Record



- Revenue Grade with Data Logging
- Waveform Capture
- DNP 3.0
- BACnet

# Acuvim II Series High Performance Meters



100ms Refresh

0.2 Class

400 Parameters

DNP 3.0

BACnet

16 MB Memory

NEMA 3

5 Year Warranty

## DESCRIPTION

The Acuvim II series are high-end multifunction power and energy meters manufactured by Accuenergy. They are the ideal choice for the monitoring and controlling of power distribution systems.

The Acuvim II series may be used as data gathering devices for intelligent power distribution systems or plant automation systems. All monitored data is available via a digital RS485 communication port running Modbus RTU and DNP 3.0 protocols, additional communication options include: Modbus, Ethernet, Profibus DP, and BACnet.

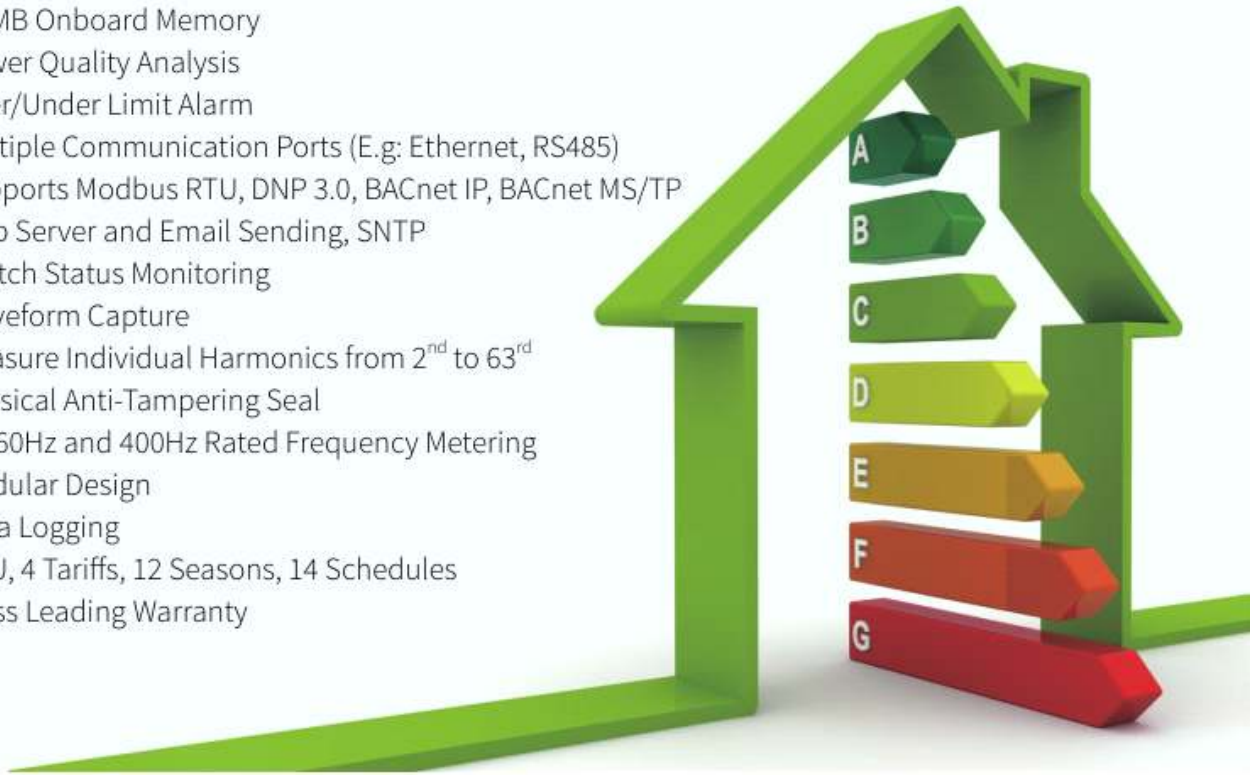
With its flexible, modular I/O and communication options, the Acuvim II series is the most versatile and cost-effective metering solution on the market.





Top quality components are meticulously engineered into a line of products offering best-in-class capability that exceeds the toughest standards and ratings.

- 100ms Refresh, True-RMS Measuring Parameter
- ANSI C12.20 (0.2 Class) and IEC 62053-22 (0.2S Class)
- 16 MB Onboard Memory
- Power Quality Analysis
- Over/Under Limit Alarm
- Multiple Communication Ports (E.g: Ethernet, RS485)
- Supports Modbus RTU, DNP 3.0, BACnet IP, BACnet MS/TP
- Web Server and Email Sending, SNTP
- Switch Status Monitoring
- Waveform Capture
- Measure Individual Harmonics from 2<sup>nd</sup> to 63<sup>rd</sup>
- Physical Anti-Tampering Seal
- 50/60Hz and 400Hz Rated Frequency Metering
- Modular Design
- Data Logging
- TOU, 4 Tariffs, 12 Seasons, 14 Schedules
- Class Leading Warranty



## APPLICATIONS

Submeters for high performance monitoring and analysis, system integration & speciality applications.

- Metering of Distribution Feeders, Transformers, Generators, Capacitor Banks and Motors
- Medium and Low Voltage Systems
- Commercial, Industrial, Utility
- Power Quality Analysis
- Data Logging



## FEATURES

### Metering

- Voltage V1, V2, V3, Vlnavg, V12, V23, V31, Vllavg
- Current I1, I2, I3, In, Iavg
- Power P1, P2, P3, Psum
- Reactive Power Q1, Q2, Q3, Qsum
- Apparent Power S1, S2, S3, Ssum
- Frequency F
- Power Factor PF1, PF2, PF3, PF
- Energy Ep\_imp, Ep\_exp, Ep\_total, Ep\_net, Epa\_imp, Epa\_exp, Epb\_imp, Epb\_exp, Epc\_imp, Epc\_exp
- Reactive Energy Eq\_imp, Eq\_exp, Eq\_total, Eq\_net, Eq\_a\_imp, Eq\_a\_exp, Eq\_b\_imp, Eq\_b\_exp, Eq\_c\_imp, Eq\_c\_exp
- Apparent Energy Es, Esa, Esb, Esc
- Demand Dmd\_P, Dmd\_Q, Dmd\_S, Dmd\_I1, Dmd\_I2, Dmd\_I3
- Load Features
- Four Quadrant Powers

### Monitoring

- Power Quality
- Voltage Harmonics 2<sup>nd</sup> to 63<sup>rd</sup> and THD
- Current Harmonics 2<sup>nd</sup> to 63<sup>rd</sup> and THD
- 400Hz type, only support 2<sup>nd</sup> to 15<sup>th</sup>
- Voltage Crest Factor
- THFF (TIF)
- Current K Factor
- Voltage Unbalance Factor U\_unbl
- Current Unbalance Factor I\_unbl
- Max/Min Statistics with Time Stamps

### Alarms

Limits can be set for up to 16 indicated parameters and can be set with a specified time interval. If any input of the indicated parameters is over or under its setting limit and persists over the specified time interval, the event will be recorded with time stamps and trigger the Alarm DO output. The 16 indicated parameters can be selected from any of the 80 parameters available.

### I/O Option Module

The E-module® technique was adopted for its flexibility and easy expansion of the I/O function of Acuvim II. A maximum of 3 modules can be used for one meter. Digital input, digital output, pulse output, relay output, analog input and analog output are provided by I/O option module.

### Anti-tampering Seal

Users can physically seal the meter similar to a utility meter in order to provide anti-tampering protection. All metrological programming and user-defined parameters are protected with a physical seal.

### High Frequency Metering

Designed for use with 400Hz aircraft systems Acuvim II series power meters effectively monitors any airborne system.

## MULTI-PLATFORM ACCESS

Built-in web server provides computer, tablet and smartphone access.



### Data Logging

AcuVim IIR/IE/IW offers 3 assignable historical logs where the majority of the metering parameters can be recorded. The onboard memory is up to 8 MB and each log size is adjustable. A real time clock allows for any logged events to be accurately time stamped.

### Time of Use

Users can assign up to 4 different tariffs (sharp, peak, valley and normal) to different time periods within a day according to the billing requirements. The Acuvim IE meter will calculate and accumulate energy to different tariffs according to the meter's internal clock timing and TOU settings.

### Waveform Capture

Acuvim IW can record 100 groups of voltage and current waveforms. It provides the waveform record of 10 cycles before and after the triggering point. It also supports a settable triggering condition.

### Power Quality Event Logging

When a power quality event happens, such as voltage sag and swell, etc., Acuvim IW will record the timestamp and the triggering condition of the event. It can save up to 50, 000 power quality events.

### Automatic Frequency adaptation

Rated frequency is adjusted automatically to local frequency such as 50Hz or 60Hz. The same meter can be used in countries with different electrical frequencies.

### Flexible Current Input

Compatible with different current transformers such as 5A, 1A, 80mA, 100mA, 200mA, 333mV output CT and Rogowski coil all available from Accuenergy.

### Communication

- Modbus RTU Protocol and DNP 3.0 via RS485
- Ethernet (Modbus TCP, HTTP, SMTP, SNTP)
- Profibus DP
- BACnet IP, BACnet MS/TP
- Dual RS485 Communication Ports

### Display

- Clear and Large Character LCD Screen Display with White Backlight
- Wide Environmental Temperature Endurance
- Display Load Percentage, 4 Quadrant Powers, and Load Nature

### Outline

Small Size 96x96 DIN or 4" ANSI Round





# FUNCTION LIST

● Function; ⊕ Option; Blank NA

CATEGORY	ITEM	PARAMETERS	Acuvim II	Acuvim III	Acuvim IIE	Acuvim IIW		
METERING	REAL TIME METERING	Phase Voltage	V1, V2, V3, Vlnavg	●	●	●	●	
		Line Voltage	V12, V23, V31, Vllavg	●	●	●	●	
		Current	I1, I2, I3, In, Iavg	●	●	●	●	
		Power	P1, P2, P3, Psum	●	●	●	●	
		Reactive Power	Q1, Q2, Q3, Qsum	●	●	●	●	
		Apparent Power	S1, S2, S3, Ssum	●	●	●	●	
		Power Factor	PF1, PF2, PF3, PF	●	●	●	●	
		Frequency	F	●	●	●	●	
		Load Features	Load Features	●	●	●	●	
	Four Quadrant Powers	Four Quadrant Powers	●	●	●	●		
	ENERGY & DEMAND	Energy	Ep_imp, Ep_exp, Ep_total, Ep_net, Epa_imp, Epa_exp, Epb_imp, Epb_exp, Epc_imp, Epc_exp	●	●	●	●	
		Reactive Energy	Eq_imp, Eq_exp, Eq_total, Eq_net, Eqa_imp, Eqa_exp, Eqb_imp, Eqb_exp, Eqc_imp, Eqc_exp	●	●	●	●	
		Apparent Energy	Es, Esa, Esb, Esc	●	●	●	●	
Demand		Dmd_P, Dmd_Q, Dmd_S, Dmd_I1, Dmd_I2, Dmd_I3	●	●	●	●		
TOU	TIME OF USE	Energy/max demand	TOU, 4 Tariffs, 12 Seasons, 14 Schedules			●		
	DAYLIGHT SAVING TIME	Two Adjustable Formats	Month/Day/Hour/Minute Month/Week/First few weeks/Hour/Minute			●		
MONITORING	WAVEFORM CAPTURE	Voltage and Current Waveform	Trigger, Manual, DI change, Sag/Dips, Swell, Over Current				●	
	POWER QUALITY	Voltage Unbalance Factor	U_unbl	●	●	●	●	
		Current Unbalance Factor	I_unbl	●	●	●	●	
		Voltage THD	THD_V1, THD_V2, THD_V3, THD_Vavg	●	●	●	●	
		Current THD	THD_I1, THD_I2, THD_I, THD_Iavg	●	●	●	●	
		Individual Harmonics	Harmonics 2 <sup>nd</sup> to 63 <sup>rd</sup> (50H or 60Hz) Harmonics 2 <sup>nd</sup> to 15 <sup>th</sup> (400Hz)	●	●	●	●	
		Voltage Crest Factor	Crest Factor	●	●	●	●	
		TIF	THFF	●	●	●	●	
		Current K factor	K Factor	●	●	●	●	
	STATISTICS	MAX with Time Stamp MIN with Time Stamp	Each phase of V & I; Total of P, Q, S, PF & F; Demand of I1, I2, I3, P, Q&S; Each phase THD of V & I; Unbalance factor of V & I			●	●	
OTHERS	ALARM	Over/Under Limit Alarm	V, I, P, Q, S, PF, V_THD & I_THD Each Phase and Total or Average; Unbalance Factor of V & I; Load Type; Analog Input of Each Channel; Demand of I1, I2, I3, P, Q&S; Reverse phase sequence; DI1-DI28			●	●	
	POWER QUALITY EVENT LOGGING	Sag/Dips, Swell	Voltage				●	
	DATA LOGGING	Data Logging 1 Data Logging 2 Data Logging 3	F, V1/2/3/Inavg, V12/23/13/lavg, I1/2/3/n/avg, P1/2/3/sum, Q1/2/3/sum, S1/2/3/sum, PF1/2/3, PF, U_unbl, I_unbl, Load Type, Ep_imp, Ep_exp, Ep_total, Ep_net, Eq_imp, Eq_exp, Eq_total, Eq_net, Es, Epa_imp, Epa_exp, Epb_imp, Epb_exp, Epc_imp, Epc_exp, Eqa_imp, Eqa_exp, Eqb_imp, Eqb_exp, Eqc_imp, Eqc_exp, Esa, Esb, Esc, THD_V1/2/3/avg, THD_I1/2/3/avg, Harmonics 2 <sup>nd</sup> to 63 <sup>rd</sup> , Crest Factor, THFF, K Factor, Sequence and Phase Angles, DI Counter, AI, AO, Dmd P/Q/S, Dmd I1/2/3			●	●	●
	ONBOARD MEMORY SIZE	Memory	Bytes	—	8MB	8MB	16MB	
	COMMUNICATION	RS485 Port, Half Duplex, Optical Isolated	Modbus <sup>®</sup> -RTU Protocol/DNP3.0 Option			●	●	
TIME	Real Time Clock	Year, Month, Date, Hour, Minute, Second			●	●		

CATEGORY		ITEM	PARAMETERS	Acuvim II	Acuvim IIR	Acuvim IIE	Acuvim IIW
OPTION MODULE	I/O OPTION	Switch Status (DI)	Digital Input (Wet)	⊗	⊗	⊗	⊗
		Power Supply for DI	24 Vdc	⊗	⊗	⊗	⊗
		Relay Output (RO)	NO, Form A	⊗	⊗	⊗	⊗
		Digital Output (DO)	Photo-MOS	⊗	⊗	⊗	⊗
		Pulse Output (PO)	By Using DO	⊗	⊗	⊗	⊗
		Analog Input (AI)	0(4)~20mA, 0(1)~5V	⊗	⊗	⊗	⊗
	Analog Output (AO)	0(4)~20mA, 0(1)~5V	⊗	⊗	⊗	⊗	
	COMMUNICATION	Ethernet	10M/100M, Modbus-TCP, HTTP Webpage, Email	⊗	⊗	⊗	⊗
		Profibus-DP	Profibus-DP/V0	⊗	⊗	⊗	⊗
		BACnet	IP or MS/TP	⊗	⊗	⊗	⊗
RS485 Module		Additional Modbus RTU	⊗	⊗	⊗	⊗	
400Hz TYPE	Only support full-wave energy, support 2 <sup>nd</sup> ~15 <sup>th</sup> individual harmonics		⊗	⊗	⊗		

### Digital/Analog I/O

Integrate data to/from other devices with field expandable plug-in I/O modules

AXM-IO1	AXM-IO2	AXM-IO3
		
6x digital inputs 24Vdc power for digital inputs 2x relay outputs	4x digital inputs 2x digital outputs 2x analog outputs	4x digital inputs 2x relay outputs 2x analog inputs

### Communications Protocols

A standard RS-485 port and our AXM line of plug-in expansions modules support a wide array of protocols.

	Standard	AXM-NET	AXM-NET-P	AXM-BMS	AXM-BIP	AXM-PROFI	AXM-RS485
MODBUS-RTU	•						•
DNP 3.0	•						
MODBUS-TCP		•	•				
HTTP Webserver		•	•				
SMTP Email		•	•				
HTTP Push			•				
BACnet-MS/TP				•			
BACnet-IP					•		
PROFIBUS						•	

## SPECIFICATION S

METERING				
Parameters		Accuracy	Resolution	Range
Voltage		0.2%	0.1V	10V~1000kV
Current		0.2%	0.1mA	5mA~50000A
Power		0.2%	1W	-9999MW~9999MW
Reactive Power		0.2%	1var	-9999Mvar~9999Mvar
Apparent Power		0.2%	1VA	0~9999MVA
Power Demand		0.2%	1W	-9999MW~9999MW
Reactive Power Demand		0.2%	1var	-9999Mvar~9999Mvar
Apparent Power Demand		0.2%	1VA	0~9999MVA
Power Factor		0.2%	0.001	-1.000~1.000
Frequency		0.2%	0.01Hz	45.00~65.00Hz (50 or 60Hz type) 300.00Hz~500.00Hz (400Hz type)
Energy	Primary	0.2%	0.1kWh	0-99999999.9kWh
	Secondary	0.2%	0.001kWh	0-999999.999kWh
Reactive Energy	Primary	0.2%	0.1kvarh	0-99999999.9kvarh
	Secondary	0.2%	0.001kvarh	0-999999.999kvarh
Apparent Energy	Primary	0.2%	0.1kVAh	0-99999999.9kVAh
	Secondary	0.2%	0.001kVAh	0-999999.999kVAh
Harmonics		1.0%	0.1%	
Phase Angle		2.0%	0.1°	0.0°~359.9°
Unbalance Factor		2.0%	0.1%	0.0%~100.0%
Running Time			0.01h	0~9999999.99h



**INPUT****Current Inputs (Each Channel)**

Nominal Current	① 5A, ② 1A, ③ 1A(333mV), ④ 1A(100mV Rope-CT), ⑤ 1A(80mA/100mA/200mA)
Metering Range	① 0~10A, ② 0~2A, ③ 0~1.2A, ④ 0~1.2A, ⑤ 0~1.2A
Pickup Current	① 5mA, ② 1mA, ③ 5mA, ④ 5mA, ⑤ 5mA,
Withstand	20Arms Continuous, 0.1% of Nominal 100Arms for 1 second, Non-Recurring
Burden	0.05VA (Typical) @ 5Arms
Accuracy	0.2% Full Scale

**Voltage Inputs (Each Channel)**

Nominal Full Scale	400Vac L-N, 690Vac L-L (+20%)
Withstand	1500Vac Continuous 2500Vac, 50/60Hz for 1 Minute
Input Impedance	2Mohm per Phase
Metering Frequency	45Hz~65Hz, 300Hz ~ 500Hz
Pickup Voltage	10Vac
Accuracy	0.2% Full Scale

**Energy Accuracy**

Active	Class 0.2s (According to IEC 62053-22) Class 0.2s (According to ANSI C12.20)
Reactive	Class 2 (According to IEC 62053-23)

**Harmonic Resolution**

Metered Value	63 <sup>rd</sup> Harmonic (50Hz or 60Hz type) 15 <sup>th</sup> Harmonic (400Hz type)
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**COMMUNICATION****RS-485 (Standard)**

MODBUS® RTU and DNP 3.0  
2 Wire Shielded Twisted Pair Cable Connection  
Baud Rate:1200~38400 bps

**The Second RS-485 Port (Optional)**

(The Same as RS-485 Standard Contents)  
Baud Rate: 4800~38400 bps

**Ethernet (Optional)**

10M/100M BaseT  
MODBUS® TCP, SNTP, HTTP Push  
Webpage Data Browsing Through HTTP Send email Based on Timer or Triggered Event

**PROFIBUS (Optional)**

PROFIBUS-DP/V0 Protocol  
Work as PROFIBUS Slave, Baud Rate Adaptive, up to 12M  
Model 1 : Input Bytes:32,Output Bytes:32  
Model 2: Input Bytes :64,Output Bytes:2  
PROFIBUS Standard According to EN 50170 Vol.2

**BACnet(Optional)**

BACnet IP, BACnet MS/TP

**STANDARD COMPLIANCE**

Measurement Standard	IEC 62053-22; ANSI C12.20
Environmental Standard	IEC 60068-2
Safety Standard	IEC 61010-1, UL 61010-1, IEC 61557-12
EMC Standard	IEC 61000-4/-2-3-4-5-6-8-11, CISPR 22, IEC 61000-3-2, IEC 61000-6-2/4
Outlines Standard	DIN 43700, ANSI C39.1

**I/O OPTION****Digital Input**

Input Voltage Range	20~160 Vac/dc
Input Current (Max)	2mA
Start Voltage	15V
Stop Voltage	5V
Pulse Frequency (Max)	100Hz, 50% Duty Ratio (5ms ON and 5ms OFF)
SOE Resolution	2ms

**Digital Output (DO) (Photo-MOS)**

Voltage Range	0~250Vac/dc
Load Current	100mA (Max)
Output Frequency	25Hz, 50% Duty Ratio (20ms ON, 20ms OFF)
Isolation Voltage	2500Vac

**Relay Output (RO)**

Switching Voltage (Max)	250Vac, 30Vdc
Load Current	5A(R), 2A(L)
Set Time	10ms (Max)
Contact Resistance	30mΩ (Max)
Isolation Voltage	2500Vac
Mechanical Life	1.5x10 <sup>7</sup>

**Analog Output (AO)**

Output Range	0~5V/1~5V, 0~20mA/4~20mA (Optional)
Accuracy	0.5%
Temperature Drift	50ppm/°C Typical
Isolation Voltage	500Vdc
Open Circuit Voltage	15V

**Analog Input (AI)**

Input Range	0~5V/1~5V, 0~20mA/4~20mA (Optional)
Accuracy	0.2%
Temperature Drift	50ppm/°C Typical
Isolation Voltage	500Vdc

**Power Supply for DI (24Vdc)**

Output Voltage	24Vdc
Output Current	42mA
Load (Max)	21 Dis

**CONTROL POWER**

Universal	AC or DC
<b>AC/DC Control Power</b>	
Operating Range	100~415Vac, 50/60Hz; 100~300Vdc
Burden	5W
Frequency	50/60Hz
Withstand	3250Vac, 50/60Hz for 1 minute
Installation Category III (Distribution)	

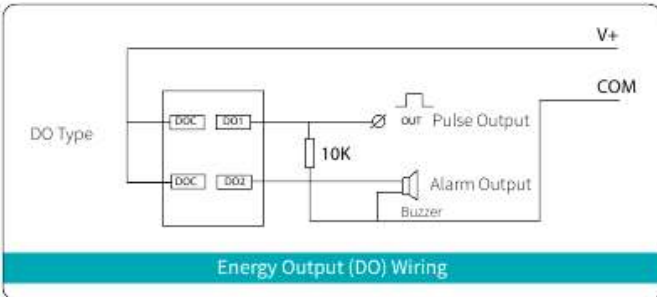
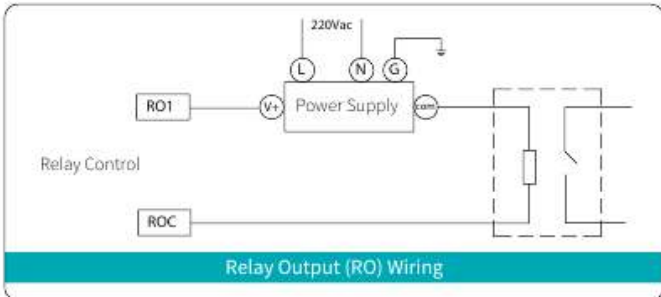
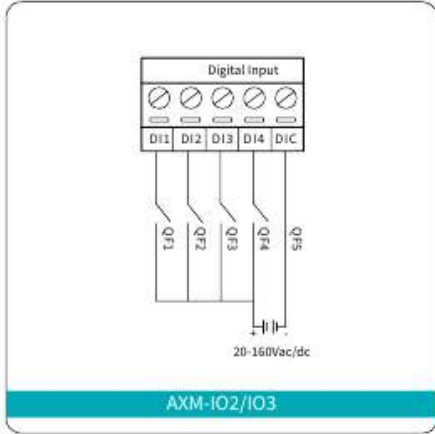
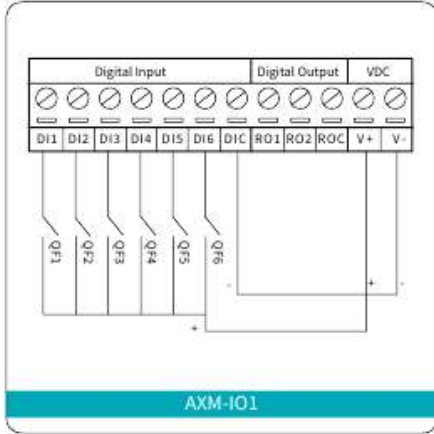
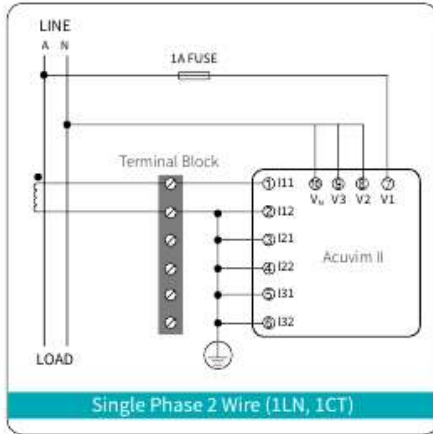
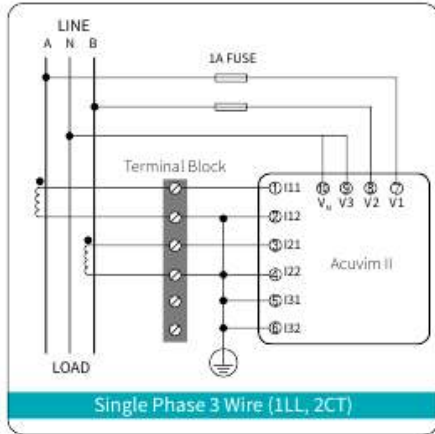
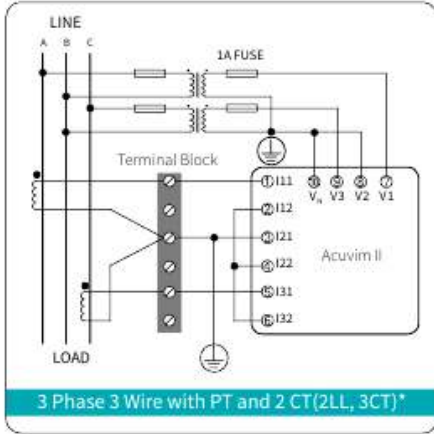
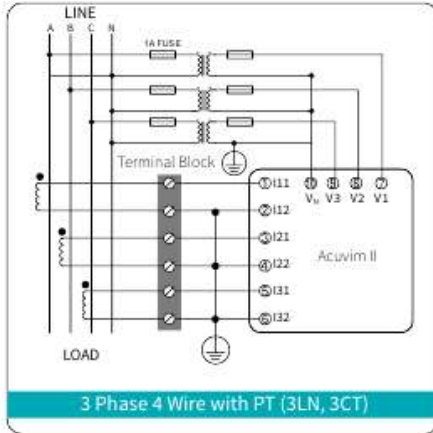
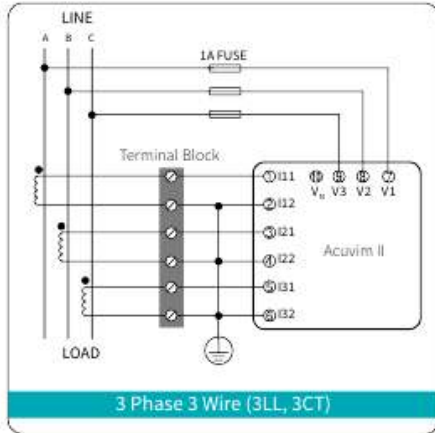
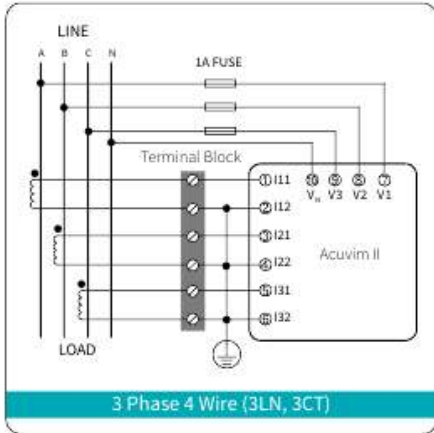
**Low Voltage DC Control Power (Optional)**

Operating Range	20~60Vdc
Burden	5W

**OPERATING ENVIRONMENT**

Operation Temperature	- 25°C to 70°C
Storage Temperature	- 40°C to 85°C
Relative Humidity	5% to 95% Non-Condensing

# TYPICAL WIRING



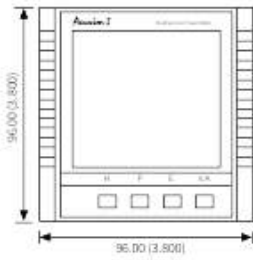
\*Note: 2CT configuration is optional only in 3 Phase 3 Wire system.



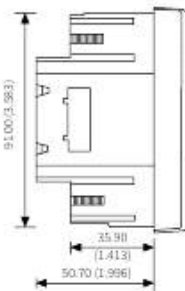
# DIMENSIONS

## Acuvim II Dimensions

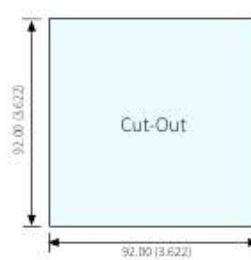
Unit: mm (inches)



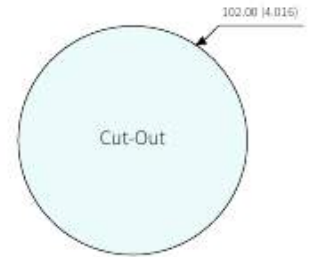
Front View



Side View

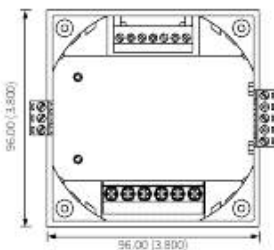


Cut Out

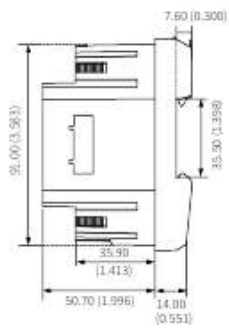


## DIN Mount Meter Dimensions

Unit: mm (inches)



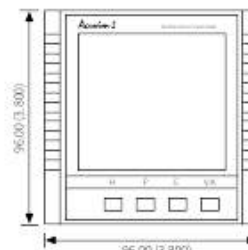
Rear View



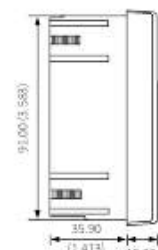
Side View

## External Display Module Dimensions

Unit: mm (inches)



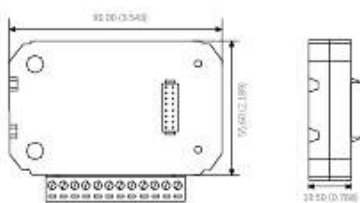
Front View



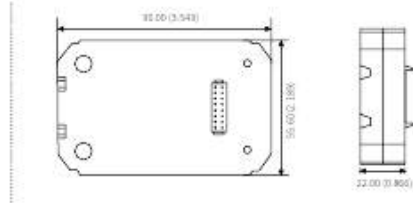
Side View

Note: 1. Display module is connected with a six foot 10 pin RJ45 cable, if you need a longer cable please specify that in the ordering statement.  
2. Display module opening size and Acuvim II body openings are exactly the same size.

## I/O Module Dimensions

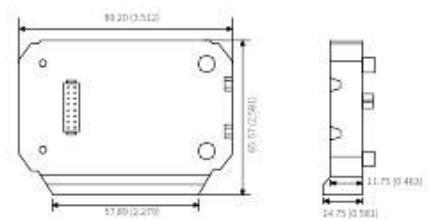


## Communication Module Dimensions



## BACnet Module Dimensions

Unit: mm (inches)





Make Energy Usage Smarter



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