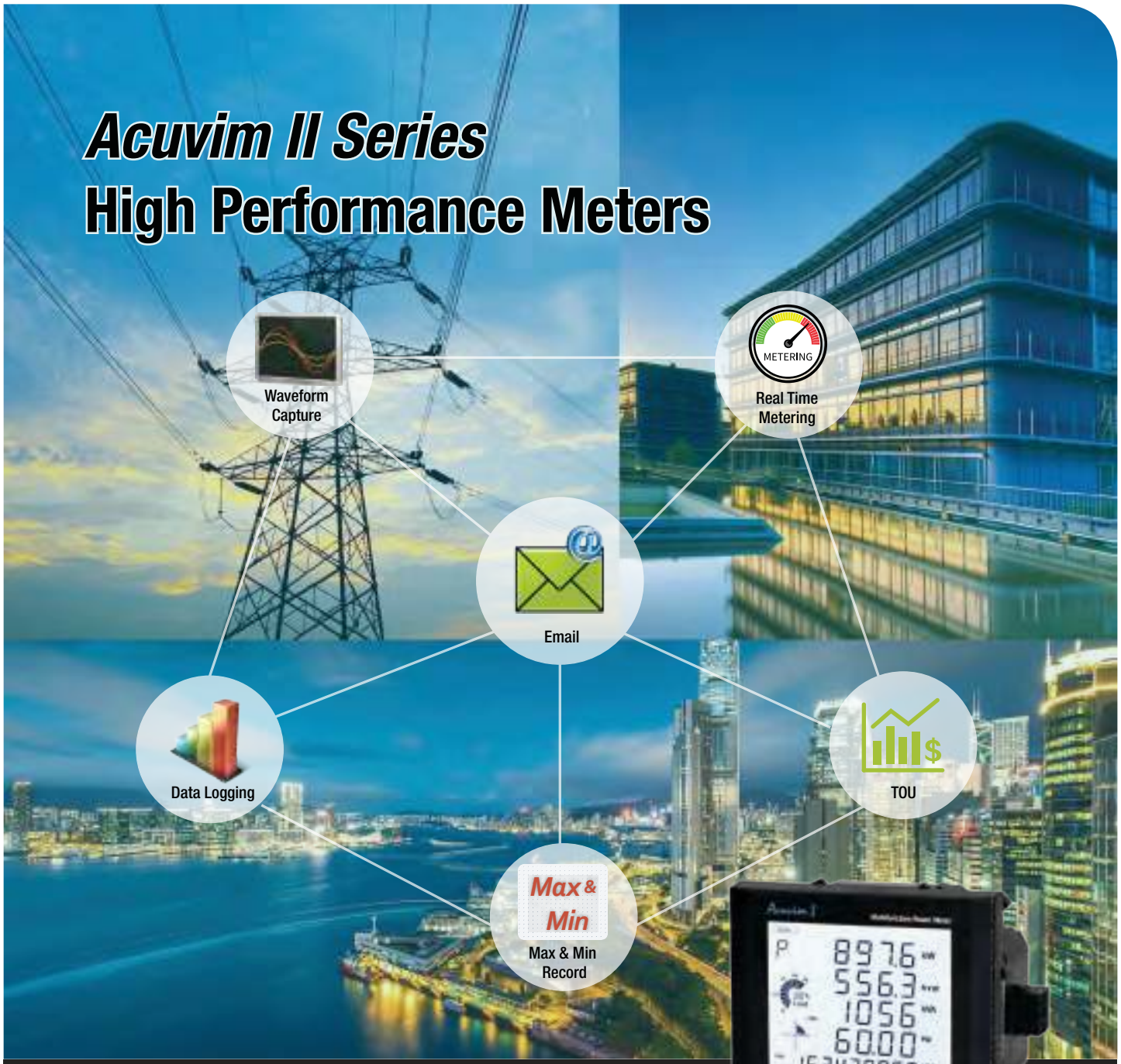
AMPTRON

Acuvim II Series
High Performance Meters



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

Test report compliance with ANSI C12.20 (0.2 Class) and IEC 62053-22 (0.2S Class)

CE cULus TÜV CERT ISO9001 Certified

ACCUENERGY

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.

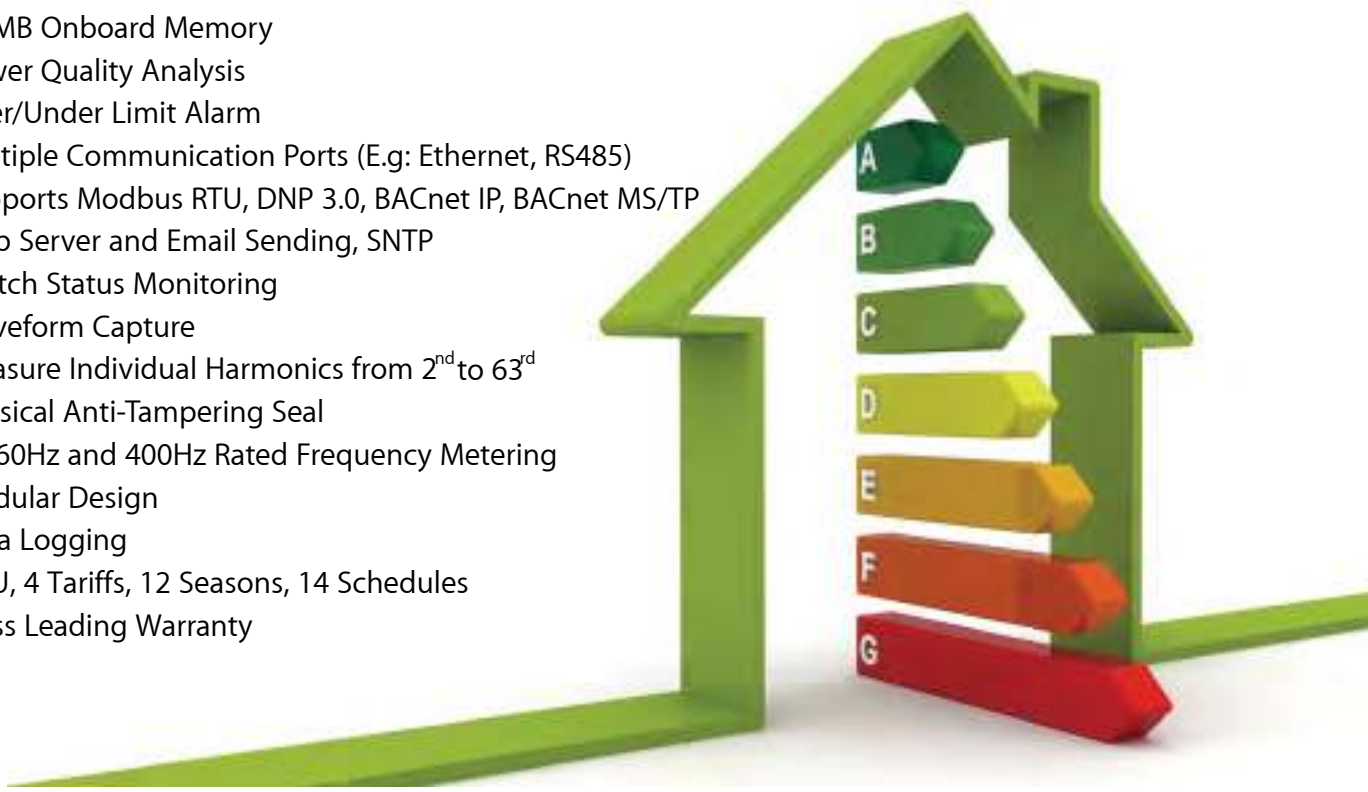
The Acuvim II series may be used as data gathering devices for intelligent power distribution systems or plant automation systems. All monitored data is available via a digital RS485 communication port running Modbus RTU and DNP 3.0 protocols, additional communication options include: Modbus, Ethernet, 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 2nd to 63rd
- 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

FUNCTION LIST

● Function; ⊙ Option; Blank NA

CATEGORY		ITEM	PARAMETERS	Acuvim II	Acuvim IIR	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 2nd to 63rd (50H or 60Hz) Harmonics 2nd to 15th (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/lnavg, 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 2nd to 63rd, 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®-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 2nd~15th 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						•	

SPECIFICATIONS

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		0.02%	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	①5A, ②1A, ③1A(333mV), ④1A(100mV Rope-CT), ⑤1A(80mA/100mA/200mA)
Metering Range	①0~10A,②0~2A,③0~1.2A,④0~1.2A,⑤0~1.2A
Pickup Current	①5mA, ②1mA, ③5mA, ④5mA, ⑤5mA,
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	63rd Harmonic (50Hz or 60Hz type) 15 th Harmonic (400Hz type)

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	$1.5x10^7$

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

AC/DC Control Power

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

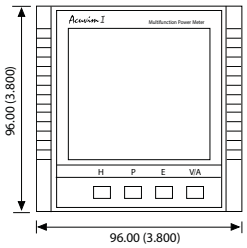
MULTI-PLATFORM ACCESS

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

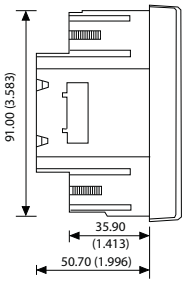
DIMENSIONS

Unit : mm (inches)

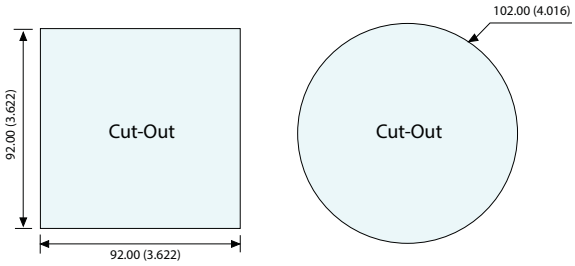
Front View



Side View



Cut Out

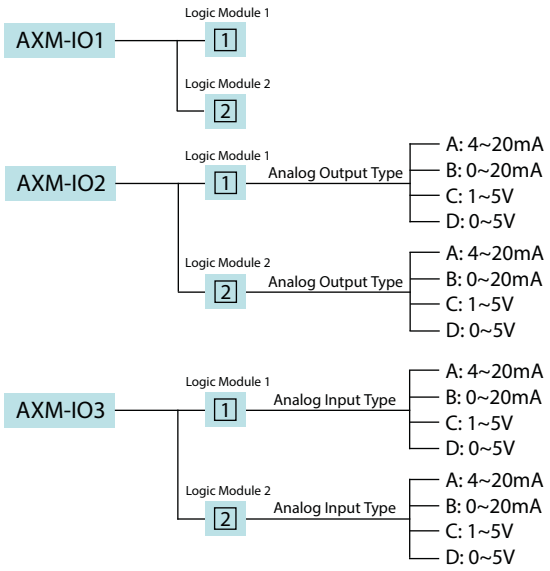


ORDERING INFORMATION

	Model	Mounting Option	Current Input	Power Supply
Ordering Number		-	-	-
Ordering Example	Acuvim IIE	- D	- 5A	- P1
	Acuvim II: Basic Model	D: Intergrated with LCD Display (Panel Mount Meter/Transducer)	5A: 5A Input	P1: 100~415Vac, 50/60Hz 100~300Vdc
	Acuvim IIR: II + Data Logging	M: Din-Rail Mount Transducer without Display (Optional Remote Display Available)	1A: 1A Input	P2: 20~60Vdc
	Acuvim IIE: IIR + Time of Use		80mA: 80mA Input	
	Acuvim IIW: IIR + Waveform Capture and PQ Event Logging		100mA: 100mA Input	
			200mA: 200mA Input	
			RCT: Rogowski Coil Input (Coil to be Ordered Feparately from Below)	
			333: 333mV Input	

Note: 1. Accuenergy suggests using USB-RS485 converter for configuration, and 3 CTs per three phase circuits.
2. All fields must be completed to create a part number.
3. Add "-S" after power supply for anti-tampering seal option.
4. Contact Accuenergy for 400Hz frequency option; 400Hz type, it don't support Acuvim IIW.

I/O Option module:



I/O Module Ordering Example: AXM-IO2-1A

Remote Display Option:

REM-[ ] — DS2: Compatible with Acuvim II Series "M" (DIN Mount) Models Only

Communication Option Module:

AXM-[ ]
- NET: Ethernet Module (AXM-NET)
- NET-P: Ethernet Module With HTTP Push Function
- PROFI: Profibus Module (AXM-PROFI)
- RS485: Modbus®-RTU (AXM-RS485)

AXM-[ ]
- BMS: BACnet MS/TP (serial)
- BIP: BACnet IP (Ethernet)

Note: 1. No more than 2 of the same I/O modules may be attached to the meter (example: Two AXM-IO2). The same two I/O modules must have a different logic number.

2. A maximum of 3 modules may be attached to the meter. If a communication module is used (example: AXM-NET), it must be installed on the back FIRST before the other modules are attached.

3. If Acuvim IIW uses DI to trigger a waveform capture, the I/O module logic number must be Module 1.