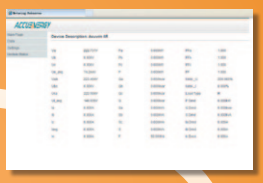
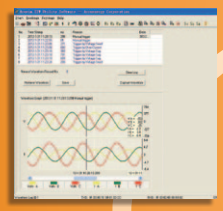
Acuvim II Series

Intelligent Power Meter (Web Accessible)

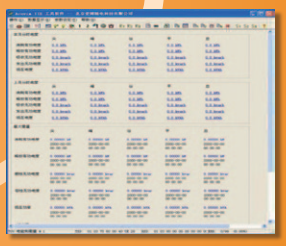


Real Time Metering

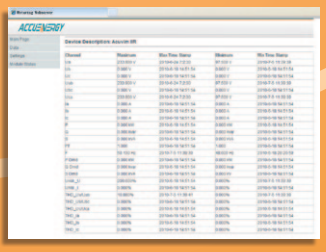
Email



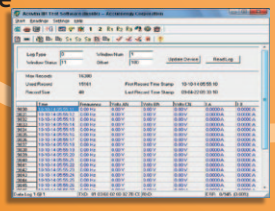
Waveform Capture



TOU



Max & Min Record



Data-Logging

- Revenue Grade with DATA-LOGGING
- WAVEFORM CAPTURE
- DNP3.0
- BACnet

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. Some of the features and electrical power parameters available on the Acuvim II series are:

- 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
- Multi Communication Ports (Eg: Ethernet, RS485)
- Support Modbus RTU, DNP 3.0, BACnet IP, BACnet MS/TP
- Web Server and Email Sending, SNMP, SNTP
- Switch Status Monitoring
- Waveform Capture
- Measure Individual Harmonics from 2nd to 63rd
- Module Design
- Data-Logging
- TOU, 4 Tariffs, 12 Seasons, 14 Schedules
- Class Leading Warranty

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. Ethernet, Profibus DP and BACnet communication are also options.

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.

Acuvim II Series Meters

● 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	●	●	●	●
		Reactive Energy	Eq_imp, Eq_exp, Eq_total, Eq_net	●	●	●	●
		Apparent Energy	Es	●	●	●	●
		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 formats adjust	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	●	●	●	●
		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 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	●	●	●	●
	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/Iavg, 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, 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	●	●	●	●
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	⊙	⊙	⊙	⊙

I/O Module (Option)

Module Name	Digital Input (DI)	Power Supply For DI (24V)	Digital Output (DO)	Relay Output (RO)	Analog Input (AI)	Analog Output (AO)
AXM-IO1	6	1		2		
AXM-IO2	4		2			2
AXM-IO3	4			2	2	

Communication Module (Option)

Module Name	Spec
AXM-NET	10M/100M self-adaptable, RJ45 Jack Modbus®-TCP/IP Protocol HTTP Web page browser Email sending on time interval or on event
AXM-PROFI	Profibus-DP/V0 Input Byte (typical): 32 byte Output Byte (typical): 32 Byte EN50170 vol.2 compliance Profibus slave mode, baud rate self-adaptable up to 12M

Module Name	Spec
AXM-RS485	Modbus®-RTU Protocol
AXM-BMS	BACnet MS/TP (Serial)
AXM-BIP	BACnet IP (Ethernet)

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
- Reactive Energy Eq_imp, Eq_exp, Eq_total, Eq_net
- Apparent Energy Es
- Demand Dmd_P, Dmd_Q, Dmd_S, Dmd_I1, Dmd_I2, Dmd_I3
- Load Features
- Four Quadrant Powers

Monitoring

- Power Quality
- Voltage Harmonics 2nd to 63rd and THD
- Current Harmonics 2nd to 63rd and THD
- 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 51 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.

Communication

- Modbus RTU protocol and DNP 3.0 via RS485
- Ethernet (Modbus TCP, HTTP, SMTP, SNMP, SNTP)
- Profibus DP
- BACnet IP, BACnet MS/TP
- Dual RS485 communication ports

Display

Clear and large character LCD Screen display with white back light
Wide environmental temperature endurance
Display Load percentage, 4 quadrants power and load nature

Outline

Small Size 96×96 DIN or 4" ANSI Round

Data Logging

Acuvim IIR/IIE/IIW offers 3 assignable historical logs where the majority of the metering parameters can be recorded. The onboard memory is up to 16 MB and each log size is adjustable. A real time clock allows for any logged events to be accurately time stamped.

Time of use

User 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 IIE meter will calculate and accumulate energy to different tariffs according to the meter's internal clock timing and TOU settings.

Waveform Capture

Acuvim IIW 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 IIW will record the timestamp and the triggering condition of the event. It can save up to 50, 000 power quality events.

Automatic Frequency adaptation

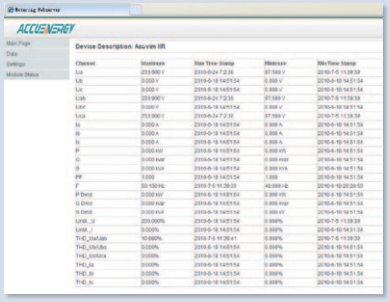
Rated frequency is adjusted automatically to local frequency such as 50Hz or 60Hz. Same meter can be used in countries with different electrical frequency.

Flexible Current Input

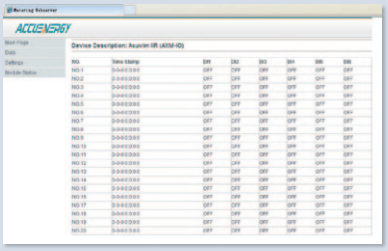
Compatible with different current transformers such as 5A, 1A, 333mV output CT and Rogowski coil all available from Accuenergy.

TYPICAL WEB PAGE FROM Acuvim II SERIES

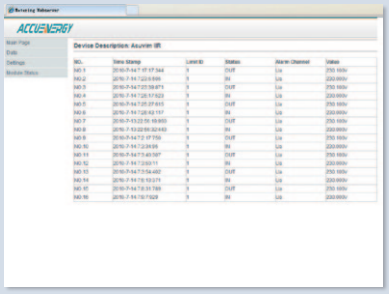
Max & Min Record



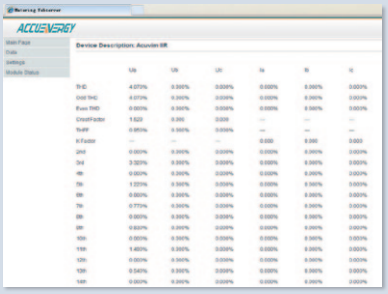
SOE Record



Alarm Record

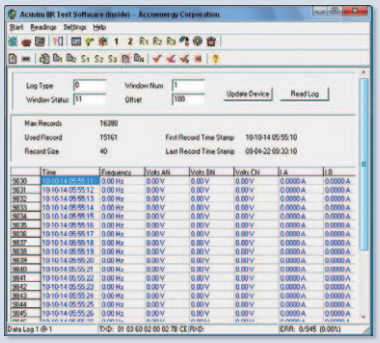


Harmonics



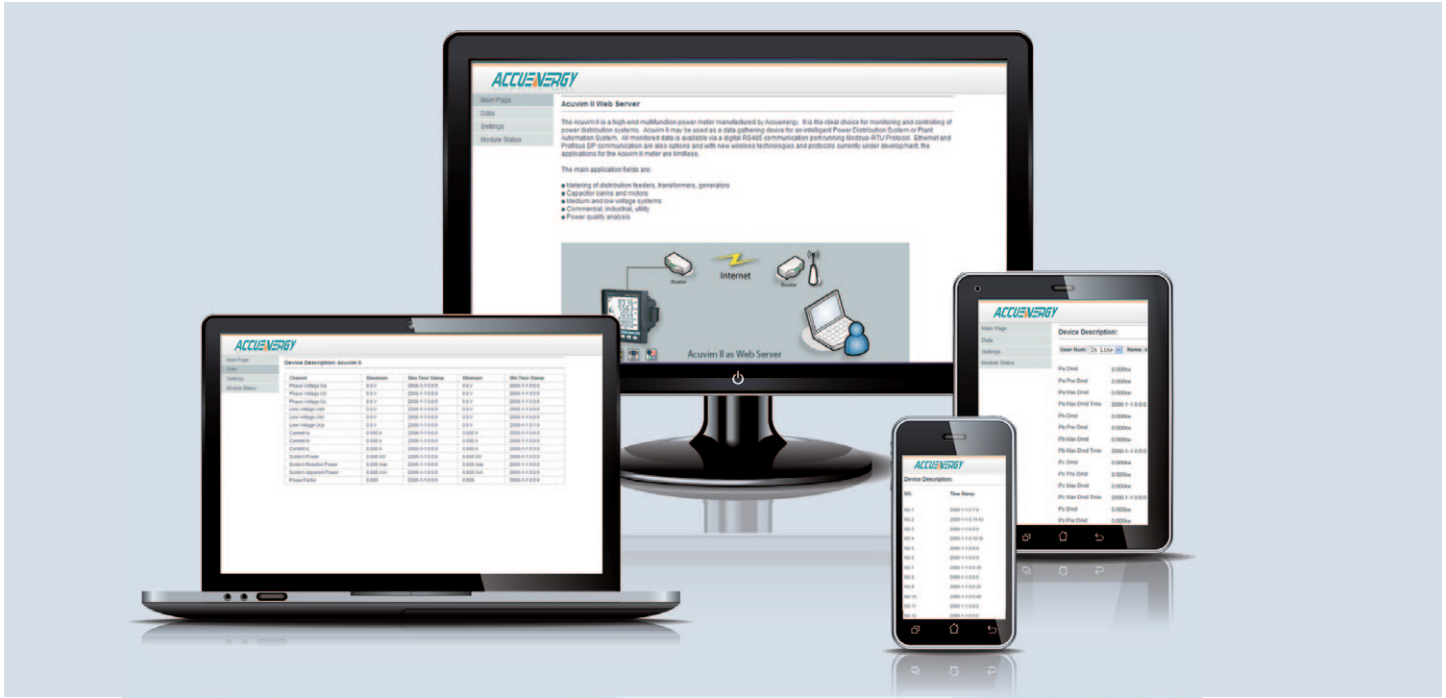
DATA LOGGING FROM Acuvim II SERIES

Data Logging

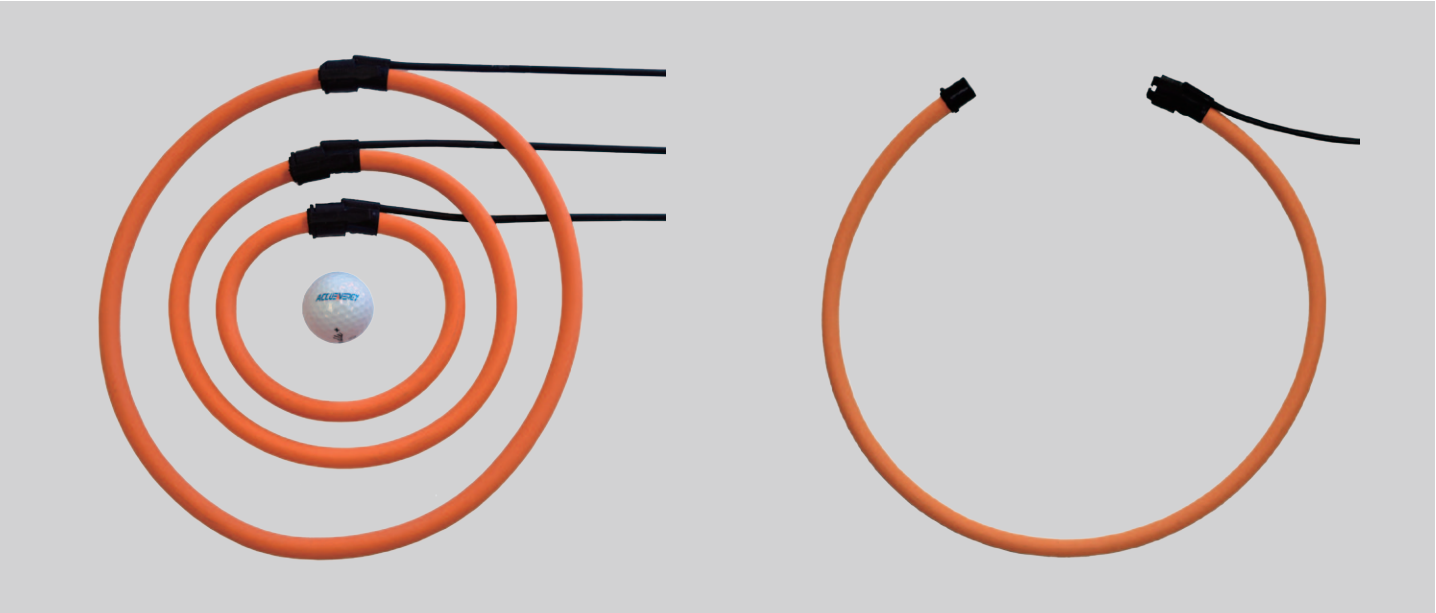


MULTI-PLATFORM ACCESS

Build-in Webserver provides computer, tablet and smart phone access

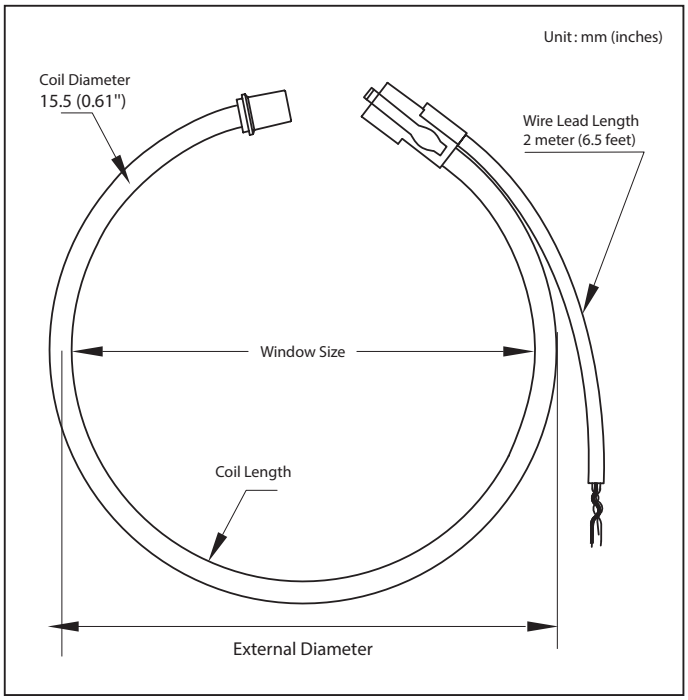


ROGOWSKI COIL



Accuenergy's Flexible Rogowski Coil is designed to use where regular solid or split core current transformers cannot fit, and ideal for power quality monitoring such as harmonics. Advantage including high accuracy, wide measruement and frequency range, and no additional integrator and power supply is needed.

SPECIFICATION	
Window Size	106mm (4.17"), 178mm (7.01"), 271mm (10.67"), 369mm (14.53")
Length of Coil	400mm (15.75"), 600mm (23.62"), 900mm (35.43"), 1200mm (47.24")
Current Range	5A - 50,000A
Frequency Range	20Hz - 5kHz
Accuracy	0.5% @1000A used with Acuvim II series
Lead	Brown-Positive,White-Negative, Bare-shield; 24AWG
Polarity	Arrow towards load (current flow direction)
Operating Tempreture	-20°C - 70°C
Temperature Drift	+/- 0.07% per °C
Material	Orange thermoplastic rubber, falme retardant UL 94 V-0 rated
Dielectric Strength	7400Vac @ 50/60Hz for 1 minute

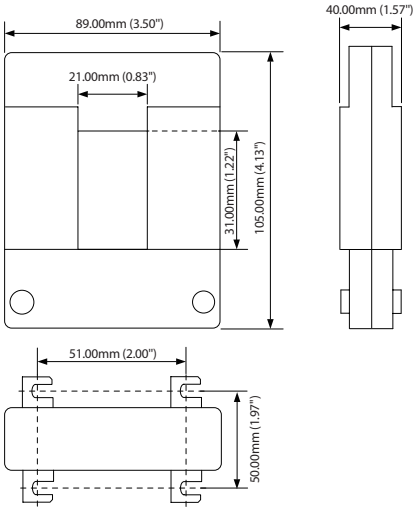


Dimensions mm (Inch)	RCT16	RCT24	RCT36	RCT47
Window Size	106 (4.17")	178 (7.01")	271 (10.67")	369 (14.53")
Coil Length	400mm (15.75")	600mm (23.62")	900mm (35.43")	1200mm (47.24")
External Diameter	143 (5.63")	207 (8.13")	302 (11.89")	398 (15.66")
Coil Diameter	15.5 (0.61")			
Wire Lead Length	2 meter (6.5 feet)			

SPLIT CORE CTS

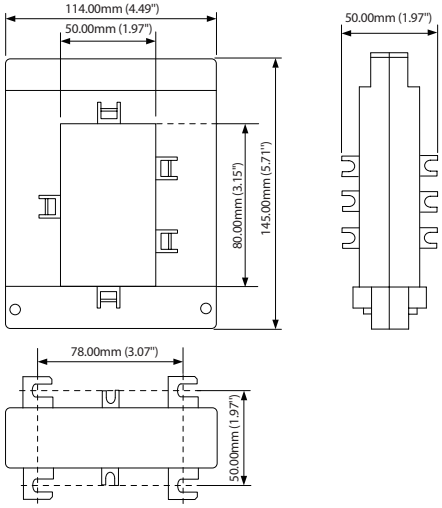
AcuCT-0812

Unit : mm (inches)



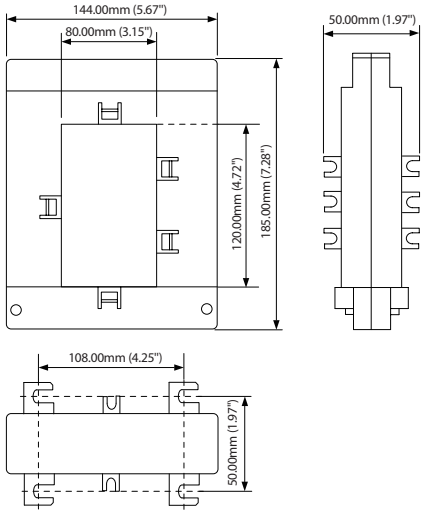
AcuCT-2031

Unit : mm (inches)



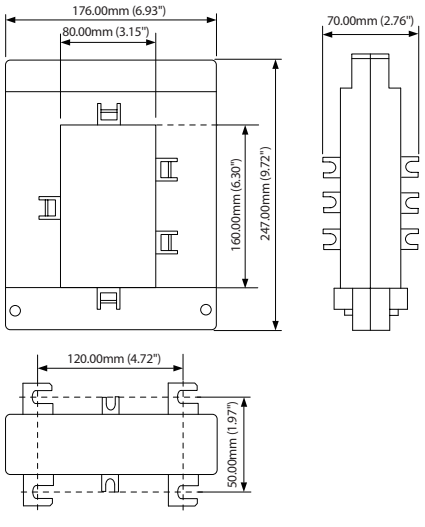
AcuCT-3147

Unit : mm (inches)



AcuCT-3163

Unit : mm (inches)



SPECIFICATIONS

METERING

Parameters		Accuracy	Resolution	Range
Voltage		0.2%	0.1V	20V~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
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	5A /1A
Metering Range	0~10A ac/0~2A ac
Withstand	20Arms continuous, 100Arms for 1 second, non-recurring
Burden	0.05VA (typical) @ 5Arms
Pickup Current	0.1% of nominal
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
Pickup Voltage	10Vac
Accuracy	0.2% full scale

Energy Accuracy

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

Harmonic Resolution

Metered Value	63rd harmonic

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, SNMP, SNTP
Webpage Data Browsing through HTTP
Sending e-mail based on the timer or triggered event

PROFI-BUS (Optional)
PROFIBUS-DP/V0 Protocol
Work as PROFIBUS slave, baud rate adaptive, up to 12M
Typical input bytes: 32, typical output bytes: 32
PROFIBUS standard according to EN 50170 vol.2

BACnet(Optional)
BACnet IP, BACnet MS/TP

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

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

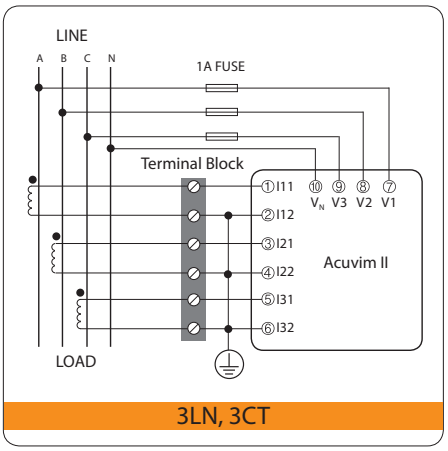
OPERATING ENVIRONMENT

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

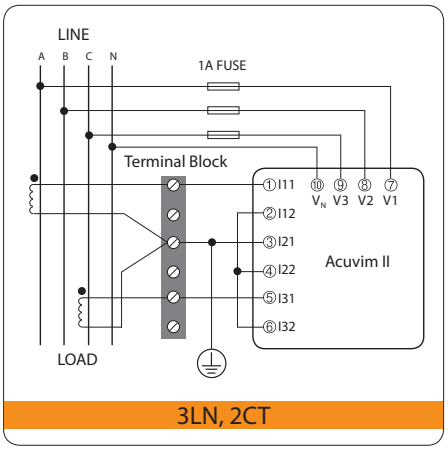
STANDARD COMPLIANCE

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

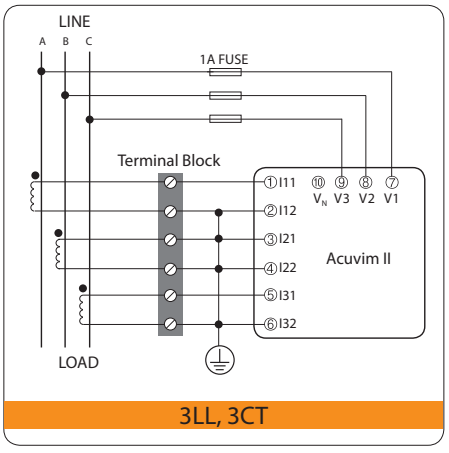
TYPICAL WIRING



3LN, 3CT



3LN, 2CT



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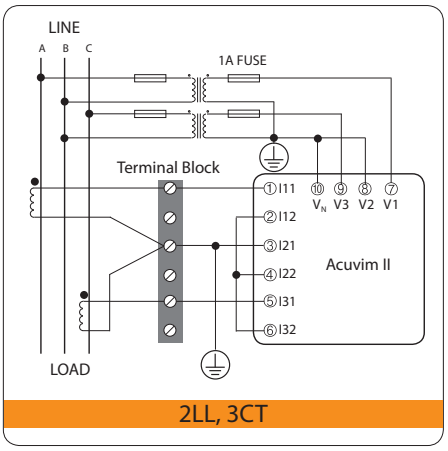
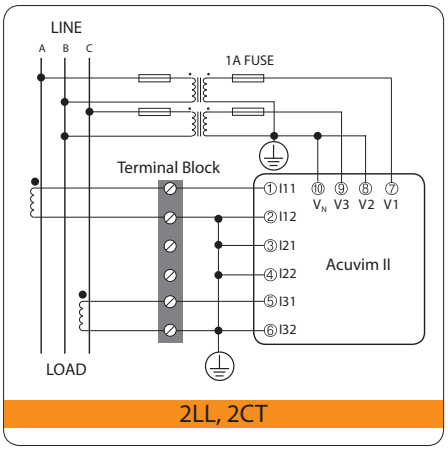
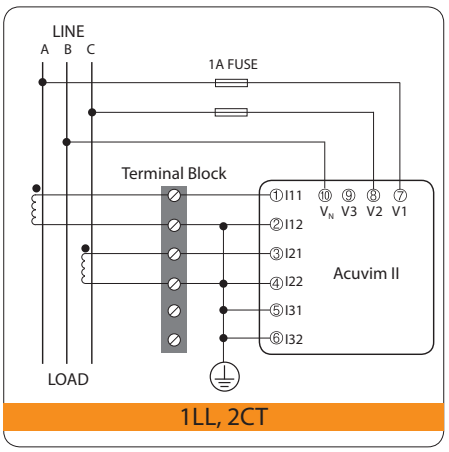


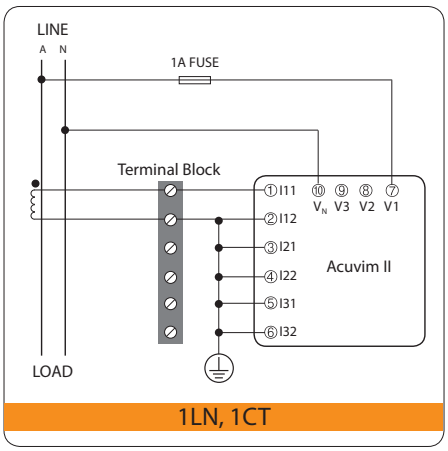
2LL, 3CT



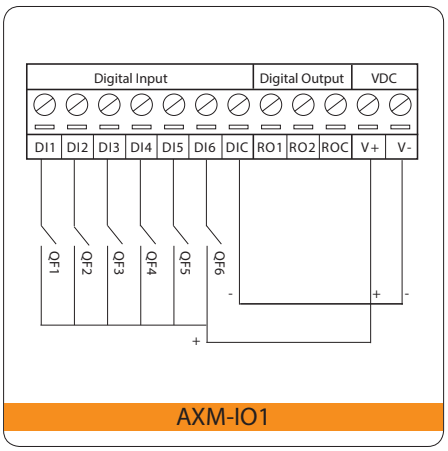
2LL, 2CT



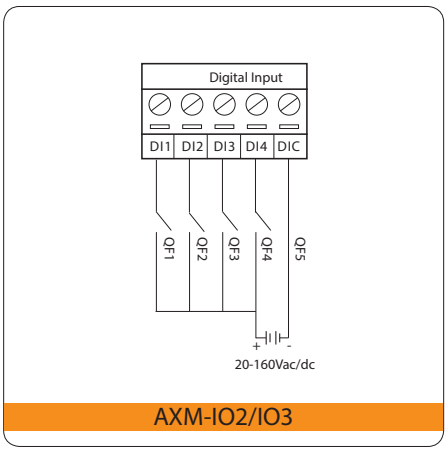
1LL, 2CT



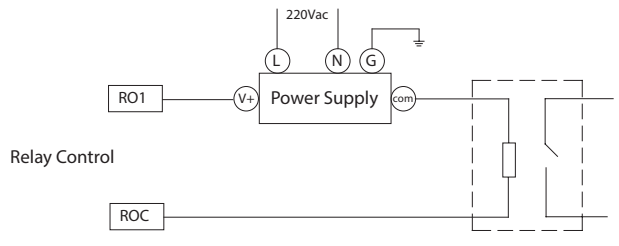
1LN, 1CT



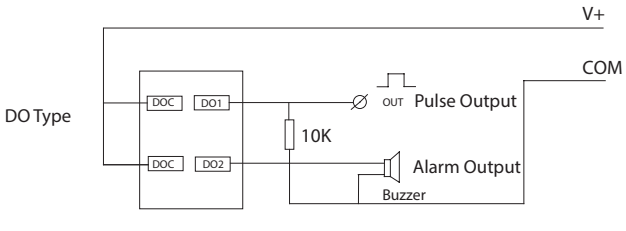
AXM-IO1



AXM-IO2/IO3



Relay Output (RO) Wiring

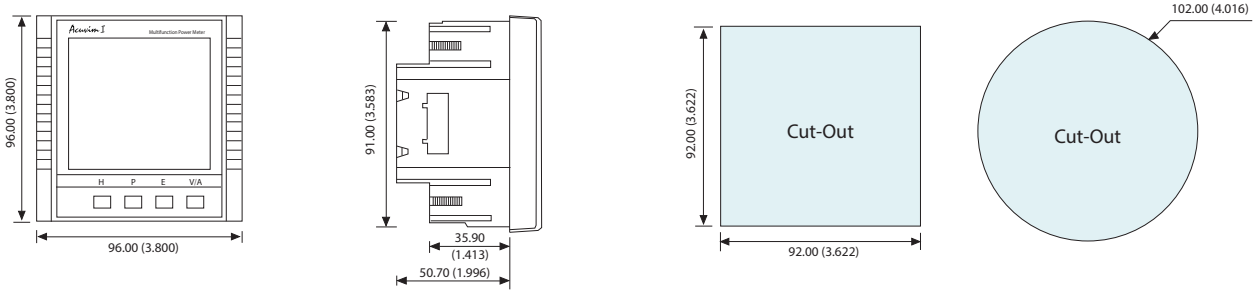


Energy Output (DO) Wiring

DIMENSIONS

Acuvim II Dimensions

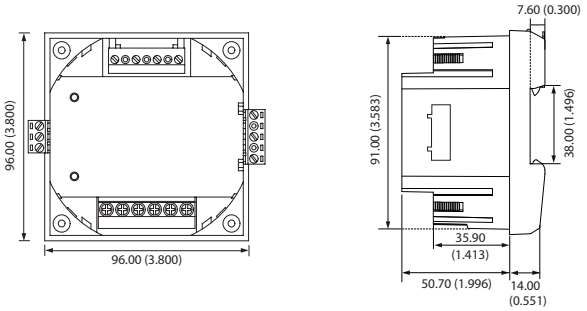
Unit: mm (inches)



Front View | Side View | Cut Out

DIN Mount Meter Dimensions

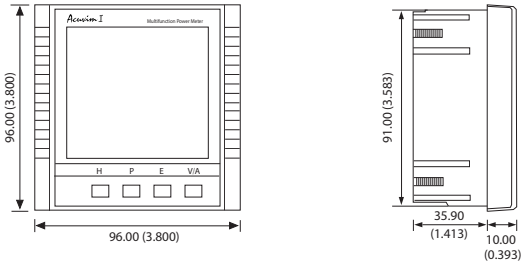
Unit: mm (inches)



Rear View | Side View

External Display Module Dimensions

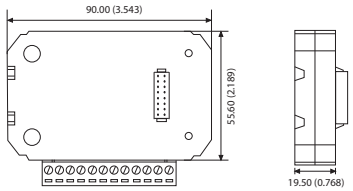
Unit: mm (inches)



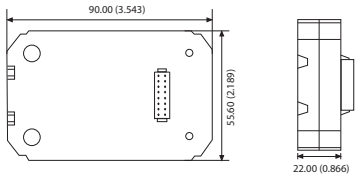
Front View | Side View

Note: 1. Display module is connected with the body length of 2 meters, such as the need for a longer line, please order statement;
2. Display module opening size and Acuvim II body openings are exactly the same size.

IO Module Dimensions

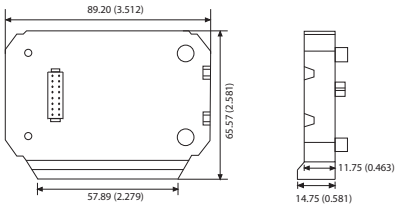


Communication Module Dimensions



BACnet Module Dimensions

Unit: mm (inches)

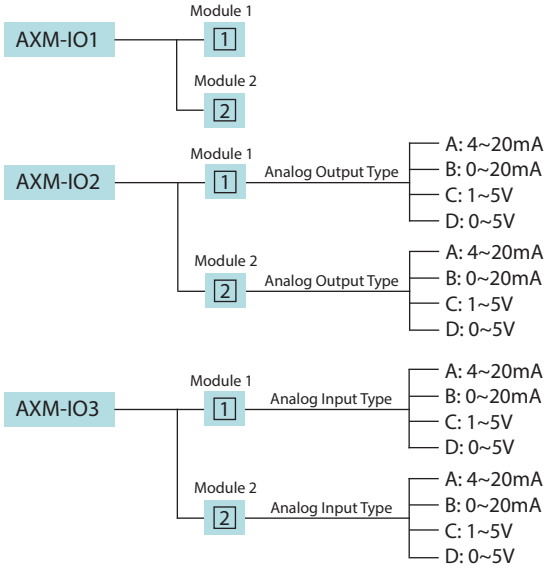


ORDERING INFORMATION

	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 + Datalogging Memory		M: Din-rail mount Transducer without Display (Optional Remote Display available)		1A: 1A Input		P2: 20~60Vdc
	Acuvim IIE: IIR + Time-of-use				RCT16: 16 inch Rogowski Coil input(3 coil included)		
	Acuvim IIW: IIR + Waveform Capture and PQ Event Logging				RCT24: 24 inch Rogowski Coil input(3 coil included)		
					RCT36: 36 inch Rogowski Coil input(3 coil included)		
					RCT47: 47 inch Rogowski Coil input(3 coil included)		
					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.

I/O Option module



IO 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)
- 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 IO modules must be a different component number.

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

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

Additional Accessories:

AcuPanel ordering information:

AcuPanel9014 (NEMA4 Indoor Panel)

AcuPanel9104X (NEMA4X WaterProof)

Split core CT ordering information:

Part Number	Window Size	Rated Input
AcuCT-0812-200-5/1	0.83"x1.22"	200A
AcuCT-0812-250-5/1	0.83"x1.22"	250A
AcuCT-0812-300-5/1	0.83"x1.22"	300A
AcuCT-0812-400-5/1	0.83"x1.22"	400A
AcuCT-2031-400-5/1	1.97"x3.15"	400A
AcuCT-2031-600-5/1	1.97"x3.15"	600A
AcuCT-2031-800-5/1	1.97"x3.15"	800A
AcuCT-2031-1000-5/1	1.97"x3.15"	1000A
AcuCT-3147-1000-5/1	3.15"x4.72"	1000A
AcuCT-3147-1200-5/1	3.15"x4.72"	1200A
AcuCT-3147-1600-5/1	3.15"x4.72"	1600A
AcuCT-3163-2000-5/1	3.15"x6.30"	2000A
AcuCT-3163-2500-5/1	3.15"x6.30"	2500A
AcuCT-3163-3000-5/1	3.15"x6.30"	3000A
AcuCT-3163-4000-5/1	3.15"x6.30"	4000A
AcuCT-3163-5000-5/1	3.15"x6.30"	5000A

Note: Please contact Accuenergy if CTs in other sizes and ratios are needed.

Rogowski Coil ordering information:

Part Number	Window Size	Coil Length
RCT16	Diameter 4"	15.75"
RCT24	Diameter 7"	23.62"
RCT36	Diameter 10.67"	35.43"
RCT47	Diameter 14.5"	47.24"

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