Acuvim L Series

Multifunction Power & Energy Meter

The Acuvim-L series multifunction power meters is the ideal choice for monitoring and controlling of power distribution system.

- True-RMS Measuring Parameter
- 4-quadrant Energy
- Power Quality Analysis
- Over/Under Limit Alarm
- Energy Pulse Output
- TOU, 4 Tariffs, 12 Seasons, 14 Schedules

Acuvim-L may be used as a data gathering device for an intelligent Power distribution System or a Plant Automation System. All monitoring data is available via digital RS485 communication port running Modbus® Protocol.

The quality of the power system is important with increasing use of electronic loads such as computers, ballasts or variable frequency drives. With the Acuvim-L power analysis option, any phase current or voltage can be displayed and the harmonic content calculated. By knowing the harmonic distribution, action can be taken to prevent overheated transformers, motors, capacitors, neutral wires and nuisance breaker trips. Redistribution of the system loading can also be determined.

Features

Metering of distribution feeders, transformers, generators, capacitor banks and motors.
Medium and low voltage systems.
Commercial, industrial, utility.
Power quality analysis.

Metering

Voltage V1, V2, V3, V12, V23, V31.
Current I1, I2, I3, In.
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.
Reactive Energy Eq_imp, Eq_exp.
Apparent Energy Es.
Demand Dmd_I1, Dmd_I2, Dmd_I3, Dmd_P, Dmd_Q, Dmd_S.

Monitoring

Power Quality.
Voltage Harmonics 2nd ~31st and THD.
Current Harmonics 2nd ~31st and THD.
Voltage Unbalance Factor U_unbl.
Current Unbalance Factor I_unbl.
Max/Min Statistics.
Meter Running Time and Load Running Time.

Alarm

Two (2) parameters may be set within a specified time interval.
If indicated parameter 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 indicated parameter can be selected from any of the 35 parameters available.

I/O option module

The Acuvim-DL/EL model can extend the I/O module. Digital input, pulse c ounter, pulse output and SOE can provided by extention I/O module.

Pulse Output option

Two digital outputs can be configured as pulse output for kWh and kvarh. The pulse rate and width can be set.

Communication

RS485, industry standard Modbus® RTU protocol;
Options are the second RS485 module, PROFIBUS-DP/VO module.

Display

Clear and large character LCD Screen display with white back light;
Wide environmental temperature endurance.

Outline

Small size 96×96×51mm (92×92 cutout) DIN or 4'' ANSI round
Extention I/O: 90×55.6×19.5mm

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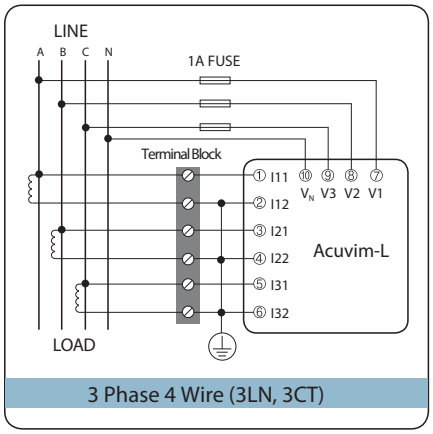
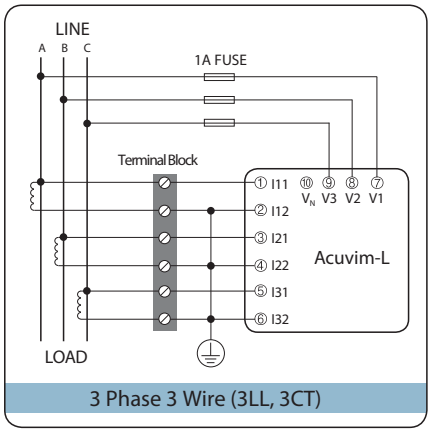
● Function ⊙ Option Blank NA

Function		Parameter	Acuvim					
			-AL	-BL	-CL	-DL	-EL	-HL
REAL TIME METERING	Phase Voltage	U1, U2, U3	●	●	●	●	●	
	Line Voltage	U12, U23, U31	●	●	●	●	●	
	Current	I1, I2, I3, In (Acuvim-KL no neutral current measurement)	●	●	●	●	●	●
	Power	P1, P2, P3, PSUM	●	●	●	●	●	●
	Reactive Power	Q1, Q2, Q3, Qsum	●	●	●	●	●	●
	Apparent Power	S1, S2, S3, SSUM	●	●	●	●	●	●
	Power Factor	PF1, PF2, PF3, PF	●	●	●	●	●	
	Load Nature	L / C / R	●	●	●	●	●	
	Frequency	F Hz	●	●	●	●	●	
ENERGY & DEMAND	Energy	Ep_imp, Ep_exp	●	●	●	●	●	●
	Reactive Energy	Eq_imp, Eq_exp	●	●	●	●	●	●
	Apparent Power	Es	●	●	●	●	●	●
	Current Demand	Dmd_I1, Dmd_I2 Dmd_I3	●	●	●	●	●	
	Power Demand	Dmd_Psum, Dmd_Qsum, Dmd_Ssum	●	●	●	●	●	
TIME OF USE	Energy	TOU, 4 Tarifas, 12 estações, 14 Horários					●	
POWER QUALITY	Voltage Unbalance	U_unbl	●	●	●	●	●	
	Current Unbalance	I_unbl	●	●	●	●	●	
	Voltage THD	THD_V1, THD_V2, THD_V3	●	●	●	●	●	
	Current THD	THD_I1, THD_I2, THD_I3	●	●	●	●	●	
	Individual Harmonics	2^{nd} to 31^{st}	●	●	●	●	●	
STATISTICS	Max Current Demand	Dmd_I1_max, Dmd_I2 _max, Dmd_I3_max	●	●	●	●	●	
	Max Power Demand	Dmd_Psum_max, Dmd_Qsum_max, Dmd_Ssum_max	●	●	●	●	●	
	Max & Min of Voltage		●	●	●	●	●	
	Max & Min of Current		●	●	●	●	●	
HOUR	Running Time	Hour	●	●	●	●	●	●
	Load Running Time	Hour				●	●	●
I/O	Energy Pulse Output	kvarh, the pulse rate and width can be set		●				
	Alarm Output			●				
COMMUNICATION	RS-485	Modbus®-RTU Protocol, 1200~38400 baud rate			●	●	●	●
	Second RS-485	Modbus®-RTU Protocol, 1200~38400 baud rate				⊙	⊙	
		PROFIBUS-DP/V0 Protocol				⊙	⊙	
EXTENSION I/O	4DI, 2DO	SOE, Pulse Counter, Pulse output, Alarm output				⊙	⊙	

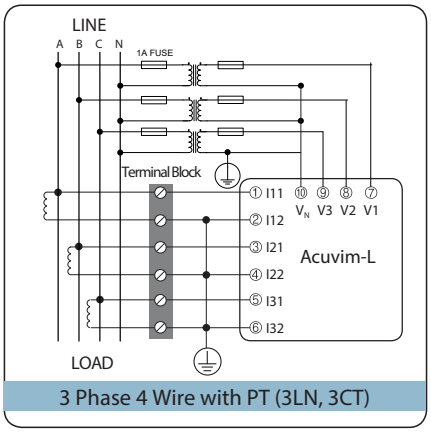
Typical Wiring



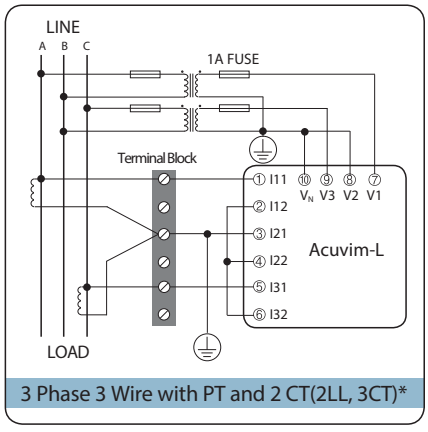
3 Phase 4 Wire (3LN, 3CT)



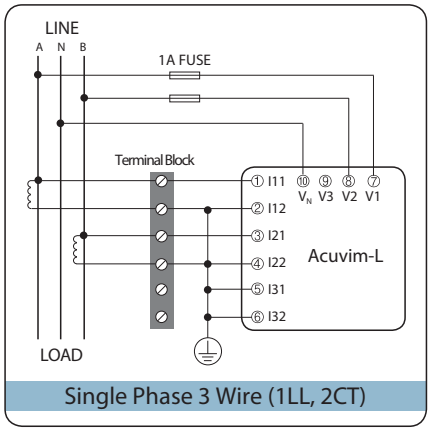
3 Phase 3 Wire (3LL, 3CT)



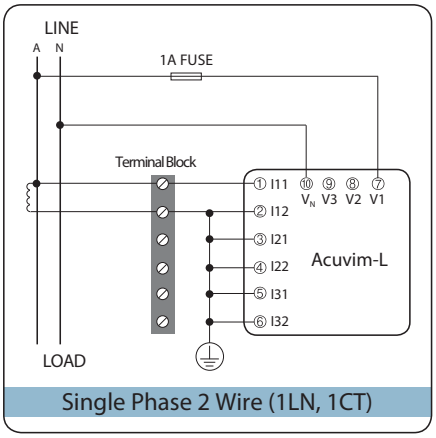
3 Phase 4 Wire with PT (3LN, 3CT)



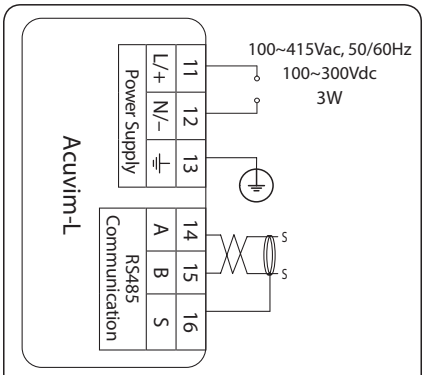
3 Phase 3 Wire with PT and 2 CT(2LL, 3CT)*



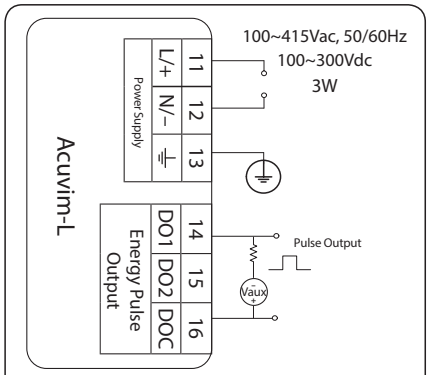
Single Phase 3 Wire (1LL, 2CT)



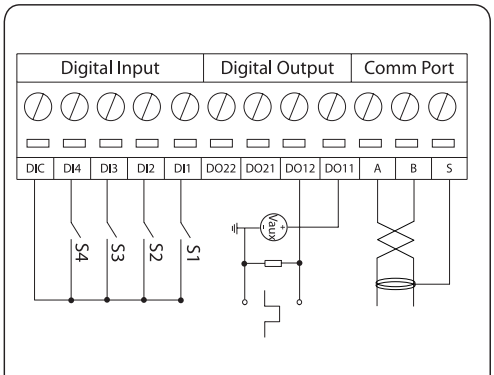
Single Phase 2 Wire (1LN, 1CT)



Power Supply+Communication



Power Supply+Energy Pulse Output (DO) #



I/O Module, DI, RO/DO Wiring Diagram

Note: 1. "*" 2CT conguration is optional only in 3 Phase 3 Wire system; 2. "#" Wiring diagram is only applicable to Acuvim BL.

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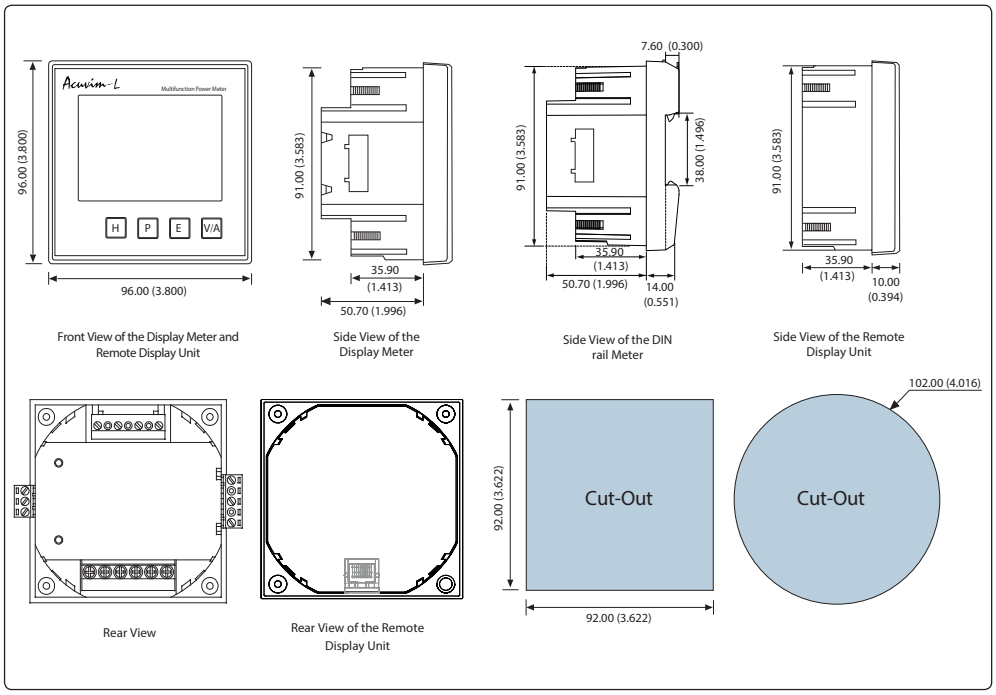
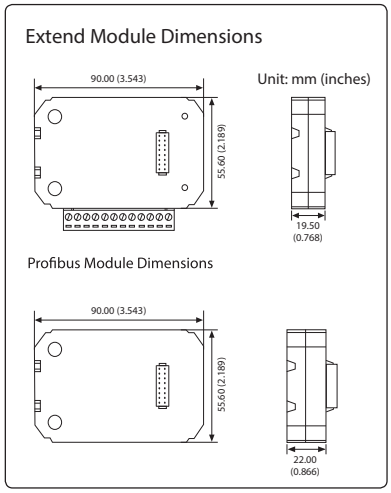
Dimensions





Note:

1. The cable length connecting the Remote Display Unit and the DIN Rail Meter is 2 metres (6 feet). Contact your customer service rep if you require a longer cable.
2. The Remote Display Unit and Display Meter have the same cutout.

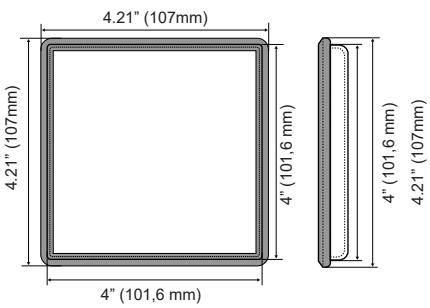
The IP66/NEMA4X Protection Cover

The IP66/NEMA4X Protection Cover is designed for Acuvim-L, Acuvim II and all 96mm by 96mm display panel meters; it increases the IP environmental rating of a meter's display to IP66 or NEMA 4X regardless of the original rating of display.
The IP66/NEMA4X Protection Cover prevents damage from dust, water, and other elements when paired with Acuvim II and L series meters they become an effective solution for high protection-required applications, such as outdoor panels.

Note: To use the display keys, easily remove the IP66/NEMA4X Protection Cover as the seal is made of durable - tight grip rubber. Simply push back in place when you're done

Dimensions

Unit: inches (mm)



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Technical Specifications

Metering

Parameters	Accuracy	Resolution	Range
Voltage	0.5%	0.1V	20V 1000kV ~
Current	0.5%	0.001A	0 ~ 50000A
Current Demand	0.5%	0.001A	0 ~ 50000A
Power	0.5%	1W	-9999MW 9999MW ~
Reactive Power	0.5%	1Var	-9999Mvar 9999Mvar ~
Apparent Power	0.5%	1VA	0 ~ 9999MVA
Power Demand	0.5%	1W	-9999MW 9999MW ~
Reactive Power Demand	0.5%	1Var	-9999Mvar 9999Mvar ~
Apparent Power Demand	0.5%	1VA	0 ~ 9999MVA
Power Factor	0.5%	0,001	-1.0 ~ 1.0
Frequency	0.2%	0.01Hz	45.00 ~ 65.00Hz
Energy	0.5%	0.1kWh	0 ~ 99999999.9kWh
Reactive Energy	0.5%	0.1kvarh	0 ~ 99999999.9kvarh
Apparent Energy	0.5%	0,1 V ah	0 ~ 99999999.9kVAh
Harmonics	1.0%	0,01%	
Meter Running Time		0.1hrs	0 ~ 999999999.9hrs
Load Running Time		0.1hrs	0 ~ 999999999.9hrs

Communication

RS-485 (Optional)
Modbus®-RTU Protocol
2-wire connection, Half-duplex, Isolated
1200 to 38400 baud rate
Sencond RS485 (Acuvim-DL and Acuvim-EL can optional)

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

Input

Current Inputs (Each Channel)

Nominal Current	5A / 1A
Metering Range	0 ~ 10 A ac / 0 ~ ac 2A
Withstand	20Arms continuous 100Arms for 1 second, non-recurring
Burden	0.05VA (typical) @ 5Arms
Pickup Current	0.1% of nominal
Accuracy	0.5%

Voltage Inputs (Each Channel)

Nominal Full Scale	400Vac L-N, 690Vac L-L (+20%)
Withstand	1500Vac continuous 2500Vac, 50/60Hz for 1minute
Input Impedance	2Mohm per phase
Metering Frequency	45Hz~65Hz
Pickup Voltage	10Vac
Accuracy	0.5%

Energy Accuracy

Active	(according to IEC 62053-22)	classe 0.5s
	(according to ANSI C12.20)	classe 0.5s
Reactive	(according to IEC 62053-23)	classe 2

Harmonic Resolution
Metered Value 2nd~31st harmonics

Operating Environment

Operation Temperature	- 25ºC to 70ºC
Storage Temperature	- 40ºC to 85ºC
Relative Humidity	5% to 95% non-condensing
Pollution Degree	2

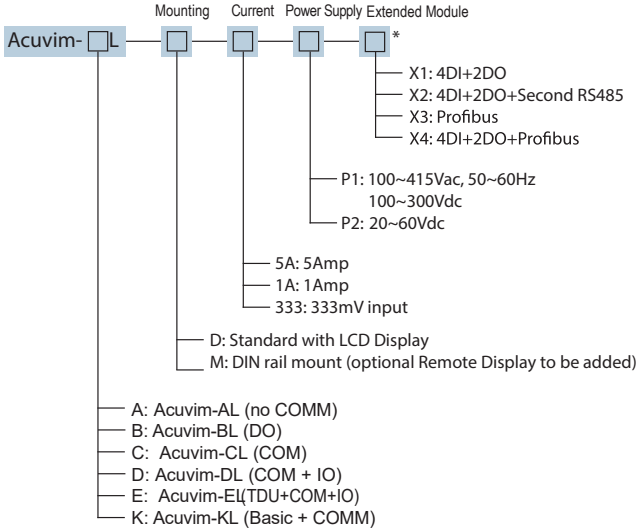
Control Power

Universal	AC or DC
AC/DC Control Power	
Operating Range	100~415Vac, 50/60Hz, 100~300Vdc
Burden	3W
Withstand	3250Vac, 50/60Hz for 1 minute
Low Voltage DC Control Power (Optional)	
Operating Range	20 ~ 60VDC
Burden	3W

Standard Compliance

Measurement Standard	IEC 62053-22 Class 0.2S, 62053-23 Class 2
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

Ordering Informatiom



Acuvim-L Series Meter Ordering Example: Acuvim-EL - D - 5A - P1 - X2

* Note:
1. Extended Modules only supported by the Acuvim-DL and Acuvim-EL models.
2. Profibus module must be installed on the back of the meter FLRST before the other module is attached.

Remote Display Option

REM - ☐ —— DS1: Compatible with Acuvim-L Series "M" (DIN Mount) models only

Remote Display Option Ordering Example: REM - DS1

Accessory

IP66/NEMA4X —— Environmental Protection Cover

Digital Input Option

Digital Input (DI)

Input Type	Dry Contact
Input Resistance	4kΩ
Pulse Frequency (Max)	100Hz, 50% Duty Ratio
SOE Resolution	2ms

Digital Output Option

Digital Output (DO)	(Photo-MOS)
Voltage Range	0~250Vac/dc
Load Current	100mA (Max)
Output Frequency (Max)	25Hz, 50% Duty Ratio
Isolation Voltage	2500V

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